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ABSTRACT

This report and research analysis relate to the Milwaukee Area Technical College Research Project, a study undertaken to determine a curriculum to meet the information processing/management training needs of individuals entering or continuing careers in the information marketing and business data processing occupational clusters. The report of this project describes the research design--a survey of approximately 400 Data Processing Management Association members and 150 members of a small business users group with follow-up interviews. These outcomes are reported: (1) respondents prioritized courses; (2) competencies in some courses were revised and upgraded; (3) a competency-based curriculum model was developed; (4) new courses were created; and (5) the training needs of employees were identified. The research analysis describes the survey technique and discusses findings of the study, which identified the topics in data processing and management information systems that businesses and industry considered essential. Findings are reported under these headings: profile of companies surveyed; job titles used in organizations; job titles that will become part of the information systems environment; priority of technical courses and of supportive courses; data analysis based on company size; and identification of technical and supportive courses. Seventeen tables are included. Appendixes contain 36 tables based on data analysis determined by company size. (YLB)

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BUSINESS MARKETING INFORMATION SYSTEMS SKILLS

VOC-ED PROJECT

Business Data Processing Career Area

Report

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PROJECT STAFF

The following combination of MATC Faculty, Staff, and area business leaders contributed to the task force study and resulting document.

Task Force Leader:	David Grypp	Associate Dean of Business, North Campus
Business Participants:	Ron Powell	Manager of Technical Services, Technology Consulting Corporation
	Darlene Severson	Project Manager, Mortgage Guaranty Insurance Corporation
	Roger Vidergar	Superintendent - Systems Support Development, Wisconsin Electric
Consultant:	Jim LeBarre	Professor of MIS, University of Wisconsin - Eau Claire
Interviewers:	Gerald Frailing	Data Processing Instructor, North Campus
	Richard W. Groh	D.P. Instructor, MATC Special Projects
Faculty:	Robert Brzycki	Computer Information Systems Instructor, West Campus
	Larry Buch	Instructional Chair, Milwaukee Campus

I. Introduction

In February of 1987, The Governor's Task Force on the Future of Working Wisconsin, reinforced the need to increased skills in information management. According to Dr. Harvey Long, Education Advisor, IBM Corporation, a presentor at the Governor's Conference, "Technology changes have and will continue to systematically occur. Wisconsin industries must adapt quickly to changing markets, if the state is to have an opportunity to exploit new technology." The skills to manage the explosion of available information falls upon the shoulders of current and future information processing professionals.

Dr. John Beetem and Mr. Jerry Lawlor, in their February 24-27, 1987, abstract of The Governor's Conference on the Future of Working Wisconsin, state 85% of ALL jobs relate to computers indirectly. In industry there are 2.1 microcomputers per employee. A large subcluster of jobs are emgerging that may require intense training and related theory in computer-based disciplines.

During the spring of 1987, the Wisconsin Vocational Technical and Adult Education department commissioned the Business Division of the Milwaukee Area Technical College to conduct a task force study to determine the curriculum necessary to meet the information processing /management training needs of individuals entering or continuing careers in the Information Marketing and Business Data Processing occupational clusters. The study was titled the BUSINESS/MARKETING INFORMATION SYSTEMS SKILLS (BMISS) curriculum project.

The task force study would result in the development and/or modification of curriculum to meet the training needs in the targeted occupational clusters. Curriculum would be structured that allows career laddering opportunities for the student.

The MATC Business Division faculty and administration clearly recognize the need for development of information processing/management skills in their students. In September of 1986 two new progams were introduced that specifically prepare students for information careers: Automated Business Support Specialist program and the Computer Information Systems program. Additionally, the Division has required all of its program students to develop basic computer skills.

John Burch in a Data Management February '86 article entitled, In A Competitive World, The Strongest Weapon Is Information, comments that "Information helps managers perform better, combat competitors, innovate, reduce conflict, and adapt to vicissitudes in the market place." Burch also projects that information technologies will be tied together by vast office systems, computer aided design and engineering (CAD/CAE), robots, artificial intelligence and expert systems, computer based message systems, electronic mail, automated warehousing and inventory control systems, advanced power equipment, electronic shopping devices, automatic test equipment, security devices and energy management systems.

"An Analysis of the Technological Skill Training Needs of the Metropolitan Milwaukee Workforce Through 1990" summary report of the Future Skills Needs-Phase II project also finds a significant need for computer skills. It states in its summary that "computer technologies clearly dominated the projected changes within all industries. Responding firms expected computers to impact on virtually all aspects of business processes and operations.

The BMISS task force recommendations for the development and modification of curriculum to insure students can effectively manage information and its technologies are presented in this report. The task force members are confident that the implementation of the recommendations will enable students to be successful in their occupational fields.

II. Objectives

The following is a list of objectives for the curriculum study. Information regarding the accomplishment of each objective is explained under part VII. Objectives/Conclusions.

1. To identify the information processing/management competencies in each of the targeted occupational clusters.

2. To revise and upgrade the information processing/management competencies in the technical core courses in the following programs:

   Automated Business Support Specialist
   Computer Operator
   Business Data Processing-Computer Programming
   Computer Information Systems

3. To develop a competency based curriculum model for career laddering in the Information Systems and Business Data Processing occupational clusters.

4. To create new courses in the Marketing Management program area that will enable students to train for jobs in information marketing.

5. To create new courses in the targeted occupational clusters that will enable further development of informational processing/management competencies.

6. To identify the training needs of the currently employed.

7. To develop workshops, seminars, and courses for those individuals currently employed who need upgrade training.

8. To identify clusters of courses which will give students competencies for specific occupations.

9. To raise the information processing/management competencies of faculty assigned to the project.

10. To ascertain from business and industry the opportunities for women, particularly in occupations traditionally dominated by males.

11. To share the project results with VTAE faculty and administrators through workshop presentations.

12. To complete project within the allocated budget.

13. To complete project by June 30, 1988.

III. Research Design

With these objectives in mind a task force was formed in September of 1988 to determine the information processing/management skills training needs of individuals preparing for or continuing careers in Business Data Processing. Members of the task force consisted of data processing professionals from various Milwaukee area companies and faculty from the Milwaukee Area Technical College. (names listed under PROJECT STAFF)

The task force met on September 11, 1988 to discuss the impact of the curriculum project on existing data processing programs as well as continuing education programs. Discussion covered such questions/topics as "What will we need five years from now?", program clusters, job sustaining skills versus technical/supervisory skills .

Input from the task force meeting was used to develop a survey distributed to approximately 400 DPMA members and 150 members of a small business users group in the beginning of January, 1988. The survey asked the individuals to prioritize courses within each of the program cluster as defined by the task force. Also, a portion of the surveys were followed up with an onsite interview focusing on the continuing education needs of the industry.

Over 90 surveys had been returned and tabulated. The data was entered into dBASE III PLUS and Lotus 1-2-3 for initial tabulation.

Preliminary results of the curriculum survey was presented at a task force meeting on February 25, 1988. Common courses to both the programming and the information systems clusters were discussed.

Using the American Association of Community and Junior Colleges Directory, six community colleges were contacted requesting a copy of their programming/information systems curriculum for further comparison. Curriculum outlines were received from the following schools:

Central Piedmont Community College	Charlotte, NC
Cuyahoga Community College District	Cleveland, OH
Dallas County Community College Dist.	Dallas, TX
DeKalb College	DeCatur, GA
Saddleback College	Mission Viejo,CA
St. Louis Community College	St.Louis, MO

On March 24, 1988 a presentation was made at the University of Wisconsin - Eau Claire MIS Conference regarding the status of the curriculum study. Bob Brzycki, Jim LeBarre, and Mike Tokheim (State Consultant for VTAE) presented the background, task force/survey procedure, and preliminary results of the project.

As a result of the task force study, a model curriculum for Business Data Processing and Computer Informations Systems programs was developed and reviewed by Pat Holy, Dean of the Business Division. The model curriculum was presented to the Business Advisory Committee on June 2, 1988. The Business Advisory Committee approved the curriculum changes as presented.

IV. Summary of Survey Findings

The following table represents the top ten courses selected by small and large companies as being the most important for the success of graduating students. The results were used as the basis for curriculum modification to the Business Data Processing program and the Computer Information Systems program.

COMPUTER PROGRAM CLUSTERS: SMALL AND LARGE COMPANIES

1. TECHNICAL COURSES

	Companies With D.P. Staff UNDER 50		Companies With D.P. Staff OVER 50	
	Programming	Information Systems	Programming	Information Systems
Computer Information Systems		X	X	X
Data Base Management	X		X	X
Decision Support & Expert Systems		X		
Integrated Systems		X	X	X
Internship				X
Microcomputers In Business				X
Programming Language - BASIC	X			
Programming Language - COBOL	X	X	X	X
Programming Language - RPG II or III	X			
Programming Language - 4th Generation	X		X	X
Structured Programming Techniques	X	X	X	
Systems Analysis and Design	X	X	X	X
Systems Software	X	X	X	X
Systems Applications	X	X	X	
Telecommunication Concepts				X
Computer User Support	X	X	X	X

2. SUPPORTIVE COURSES

Accounting Basics	X	X	X	X
Business Math	X	X	X	
Managerial Accounting	X	X	X	X
Principles of Business	X	X	X	X
Report Writing		X	X	X

General Comments: Programming

Both large and small companies indicated Structured Programming Techniques and Programming Language - COBOL are very important to the Programming track. Due to the installation of minicomputers at many small company sites, RPG II or III was listed as the most important course within a programming curriculum for these companies.

Even though the primary thrust of this track is programming, systems courses such as Systems Analysis and Design, Data Base Management, and Computer User Support are necessary in the programming track. Members of the task force reinforced this finding stating that in today's environment a programmer no longer just sits in front of a terminal and writes code. Interaction with end users begins almost immediately.

Interesting is that even though an internship was not in the top ten courses for the Programming track 42% of the companies responding to the survey indicated an interest in participating in the internship program in cooperation with MATC.

General Comments: Information Systems

Both small and large companies indicated Computer Information Systems, Systems Analysis and Design, and Programming Language - COBOL are very important to the Information Systems track. Data Base concepts were considered essential to the track by large companies. The task force reinforced the need to develop a broad perspective of information processing. Also, the task force mentioned all large companies use some type of data base to support their applications making data base concepts very important.

Smaller companies placed a high priority on the understanding of systems and how the data flows between those systems. This probably due to the purchasing of software packages rather than in-house development of applications. The purchased software packages must be able to transfer data between them for a successful operation.

V. Conclusions

The following is a response to the objectives listed earlier in the report. The accomplishment of each objective during the project is stated below.

1. To identify the information processing/management competencies in each of the targeted occupational clusters.

   Conclusion: Accomplished through the development of a survey instrument to identify the courses/competencies area businesses find to be important for each occupational cluster. The survey was developed with input from the task force committee.

2. To revise and upgrade the information processing/management competencies in the technical core courses in the following programs:

   Automated Business Support Specialist
   Computer Operator
   Business Data Processing-Computer Programming
   Computer Information Systems

   Conclusion: Modification to the existing Business Data Processing and Computer Information Systems programs were recommended and approved by the Business Data Processing Advisory Committee on June 2, 1988. The task force felt that a Computer Operations Curriculum would not be warranted at this time. Computer operations training is done in-house due to the variety of equipment used by area companies. A two year associate degree operations program would not eliminate or greatly excelerate the in-house training according to the task force business representatives.

3. To develop a competency based curriculum model for career laddering in the Information Systems and Business Data Processing occupational clusters.

   Conclusion: Based upon survey results, curriculum changes have been made to the Information Systems and Business Data Processing programs. Again, the changes were approved by the Business Data Processing Advisory Committee on June 2, 1988.

4. To create new courses in the Marketing Management progrm area that will enable students to train for jobs in information marketing.

   Conclusion: Accomplished by the Marketing component of the project.

5. To create new courses in the targeted occupational clusters that will enable further development of informational processing/management competencies.

   Conclusion: The following courses have been suggested for development with the curriculum changes.

   Microcomputer Networks
   Computer Data Security
   Computer Operations
   Trends In Information Computing
   Programming Languages

6. To identify the training needs of the currently employed.

   Conclusion: Need to continue to offer microcomputer software package courses. Most small companies want to see an expansion of System/36 skills taught. Computer User Support should be offered to current data processing professionals. The Out Rearch program could become involved in offering a workshop based upon the Computer User Support course.

7. To develop workshops, seminars, and courses for those individuals currently employed who need upgrade training.

   Conclusion: The development of the workshops, seminars, and courses for individuals currently employed is under consideration. The need course offering listed in conclusion of objective 5 could be a foundation for these offerings.

8. To identify clusters of courses which will give students competencies for specific occupations.

   Conclusion: Through the survey, task force meetings, and curriculum modifications the student competencies have been identified and addressed.

9. To raise the information processing/management competencies of faculty assigned to the project.

   Conclusion: Accomplished through the networking which took place on the task force and during the on-site interviews of area managers.

10. To ascertain from business and industry the opportunities for women, particularly in occupations traditionally dominated by males.

    Conclusion: Secondary research indicates an increased opportunity of women in the data processing field.

11. To share the project results with VTAE faculty and administrators through workshop presentations.

    Conclusion: On March 24, 1988 a presentation was made at the University of Wisconsin - Eau Claire MIS Conference regarding the preliminary results of the curriculum project. Further presentations are planned for the future.

12. To complete project within the allocated budget.

    Conclusion: Project was completed within budget.

13. To complete project by June 30, 1988.

    Conclusion: Project was completed by June 30, 1988.

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BUSINESS MARKETING INFORMATION SYSTEMS SKILLS

VOC-ED PROJECT

Business Data Processing Career Area

Research Analysis

Jim La Barre

An Analysis of the Research Methodolgy

Introduction

A large number of research methodologies exist and to say that one is better than another, you would have to be well aware of the subjects to be researched, the topic to be researched, and more importantly how the data is to be analyzed upon completion of the research. The BMISS project required that data be collected from numerous types of businesses and industries of various sizes. As was previously stated in the report, the purpose of the research was to determine what business and industry felt was important in the delivery of subject matter material in the data processing/ management information systems curriculum at the two year college level.

Research Methodology

The data for the BMISS project was collected by administering a questionnaire survey to members of the Data Processing Management Association and the Association of Systems Managers employed by businesses and industries in Milwaukee and the surrounding area. An interview technique was used to follow-up and validate findings from participants of selected businesses.

Any research conducted must rely on the statistical sampling of a very large group that may exist. Therefore, it is necessary to randomly select from the group a sampling that represents the total. It is difficult to determine if the sample is large enough or too small. However, well-known statisticians will tell you that a sample of 30 out of 3000 is adequate to represent the total. That represents only one percent of the total population. Assuming that the sample for this research project was chosen randomly, the sample of 84 participating firms is more than adequate to represent what is happening in business and industry. The task force for the BMISS project felt that the stratified sampling technique used would provide the most complete and valid returns.

The survey technique was the most valid method of data collection for this study. Since the total could not be sampled, it was necessary to use a stratified sample. There are numerous sampling techniques and any one is acceptable as long as it is administered consistantly. (ie. From a list of companies in the business directory, every fourth company was chosen to participate in the study.)

A researcher must also be concerned about the types of businesses selected if it is to play a major role in the analysis of the data. If it is to be a major player, we must assume that an equal number of participants were selected from each of the business types. If not, then this factor may not be used in the analysis. If the researcher was concerned with the findings based upon the size of the business, he/she must also randomly select an equal number of participants from the different business types which fit into a particular size grouping. Assuming that the participants were selected randomly from the group as a whole, the data returned could only be analyzed on the basis of the response, and not on the basis that the research controlled the independent variables such as size and type of business. Good research technique requires that the researcher make these decisions before the data is collected and not after it has been collected. Therefore, the researcher must report only what he/she has found and not attempt to do something with data that had not been previously planned prior to carrying out the research.

In the BMISS project, we chose to use size as an alternative means of analyzing the data. Since one of the questions on the survey instrument collect this data, it was a valid variable upon which to compare results.

BMISS RESEARCH METHOD AS A MODEL

Often the first study of a given type will serve as a model for many studies that follow and are very similar in structure. The task force for BMISS determined that the model used was one of the best methods used to collect information upon which to build a valid curriculum for preparing students.

The Research Method as a Model

More recently, sampling practices have become more objective, sophisticated, and, most practitioners would agree, more reliable. Application of random sampling techniques makes it possible to derive results from tests of fewer items than was typical of block sampling. The researcher must insure that the attributes selected for sampling are valid concerns or information that the participants are interested in providing. This validity will help to insure that the expect rate of error will be diminished and the findings will provide an acceptable confidence level upon which to draw conclusions. The stratified sample used in this study were very much concerned with the issues being addressed, therefore, the high rate of return indicated that quite likely the survey instrument was filled out dilgently.

Process of Administering

The process of administering a questionnaire survey to collect information about curriculum issues is very appropriate. The follow-up interviews insures that the respondent did indeed answer the questions in the manner that was consistent with what the researcher had expected him/her to interpret the questions.

The validation of the survey instrument via a pilot study will help to insure that the questions will be easily interpreted. The advisory committee is a good jury to use in pilot testing a survey instrument. Once the instrument has been pilot tested and modified, the researcher must consistently administer the survey. Follow-up mailings may be required if the returns are very low. Any interviews that follow should be based upon a random selection process. Each interview must be conducted in a similar manner.

Summarization of the Findings

The researcher must determine how the data is going to be summarized prior to collection and during the development of the survey instrument. This is necessary so that data collected may be statistically treated using appropriate statistical techniques.

Analysis of data via a frequency distribution will reveal many interesting conclusions. However, if data is recorded correctly, there are many other statistical techniques that may tell the researcher more about the data. For example, if size

of the company in terms of dollar volume or number of employees is collected and recorded correctly, one could run an analysis of variance to determine if the conclusions are dependent upon an independent variable. The key point to be made, however, is the correct recording of the data.

Reporting of the Findings

The findings must be reported clearly and with integrity. The researcher must report only what was found. Within the conclusions, valid observations may be drawn. The BMISS project utilized not only the task force, but the advisory committee and faculty, to interpret findings from the interview. Therefore, when the curriculum was developed, it was based upon what the data revealed as reported in the findings of the report.

Statement of Validity of Research Procedures

Validity of Research Methodology

The research methodology utilized in the BMISS project was valid if the following existed:

1. The participants were randomly selected to participate in the study or all persons from a stratified group or groups were selected to participate.
2. The questionnaire was pilot tested and reviewed by a board of review.
3. The questionnaire was administered to all participants in the same consistent manner.
4. The interviewing process was carried out consistently on a randomly selected group to validate the findings.

If we make the assumption that all of these factors were completed in a consistent manner, then it would be fair to say that the research methodology was valid.

Analysis of Data

The data collected as a result of the questionnaire survey was analyzed and summarized to determine the frequency distribution. Because there is no relationship between a priority of 1 and a priority of 9, it would be incorrect to determine a mean priority and base the conclusions on that number. Rather, the frequency of a 1 priority in relationship to a frequency of a 9 priority is much more meaningful. The relationship of how Operations/Technical responded to how Programming responded is meaningful and therefore may be used to draw conclusions. This information may be compared with the information collected as a result of the interviewing process. If they agree, one could draw valid conclusion that something does or should exist. The data analysis from the study appears in another section within this report.

FINDINGS

The purpose of this study was to identify the topics in data processing and management information systems that businesses and industry felt contributed most to the successful education of students who are to become new employees. An analysis of the data was completed using several software packages. As a result of this analysis, a model curriculum was developed by the task force. This curriculum, which appears later in this report, was validated via an advisory committee meeting with representatives of business and industry and by the data processing faculty.

The survey was mailed to a stratified sample made up of persons belonging to the Data Processing Management Association and the Association for System Managers. These persons are employees of selected businesses and industries in the Milwaukee area. The survey instrument was returned by 84 businesses and industries and the results were validated by conducting a follow-up interview with 24 persons who had completed the survey. The data was compiled and analyzed utilizing LOTUS 1-2-3, dBase III Plus, and STATPAC. The information was analyzed as a complete data set. It was further analyzed based on the size of the company returning the survey. The results are contained within this section of the report.

The findings of this study are reported under the following headings:

1. Profile of Companies Returning the Survey Instrument.
2. Job Titles Used in Organizations
3. Job Titles Which Will Become a Part of The Information Systems Environment.
4. Priority of Technical Courses Necessary for Preparing Students for Employment.
5. Priority of Supportive Courses Necessary for Preparing Students for Employment.
6. Analysis of Data Based on Company Size Determined by Number of Employees Within the Company.
7. Identification of Technical Courses for Preparing Students in the Operations/Technical, Programming and Information Systems Clusters.
8. Identification of Supportive Courses for Preparing Students in the Operations/Technical, Programming, and Information Systems Clusters.

Profile of Companies Returning the Survey Instrument

The respondents were asked to identify which category best described the industry in which their company was involved.

Table 1 contains the ten categories and the number responding. The large majority were manufacturing in nature. Service companies made up the next largest group.

Table 1
COMPANY PROFILE BASED ON BUSINESS CATEGORY
N = 84

Category	Number	Percent
Banking/Finance	3	3.57
Education	3	3.57
Government	4	4.76
Health	2	2.38
Insurance	4	4.76
Manufacturing	40	47.61
Retail	4	4.76
Service	16	19.04
Wholesale/Distribution	5	5.95
No Response	3	3.57

The respondents were also asked to identify the size of their company based upon total employees. Table 2 indicates that the largest number of respondents employed between 100 and 499 employees.

Table 2
SIZE OF COMPANY BASED ON TOTAL EMPLOYEES
N = 84

Number of Employees	Number	Percent
1 - 99	18	21.42
100 - 499	35	41.67
500 - 999	11	13.09
1000 +	19	22.62
No Response	1	1.19

The respondents were asked to identify the number of data processing and management information systems employees in the company. Table 3 indicates that most companies employ less than 10 data processing employees.

Job Titles Used in Organizations

The respondents were asked to identify present job titles related to data processing and management information systems that were identifiable within their organization. Table 4 identifies the job titles and the number of organizations stating that the job existed within their organization.

Table 3
NUMBER OF DATA PROCESSING EMPLOYEES
IDENTIFIED BY PARTICIPATING COMPANIES
N = 84

Number of Data Processing Employees	Number	Percent
1 - 9	50	59.52
10 - 49	21	25.00
50 - 99	5	5.95
100 +	8	9.53

Table 4
JOB TITLES CURRENTLY EXISTING
WITHIN ORGANIZATIONS

Job Title	Number
Communications Analyst	5
Communications Operator	4
Communications Specialist	6
Computer Operator	62
Data Base Analyst	13
Data Base Manager	8
Data Base Administrator	13
Data Center Manager	24
Data Center Supervisor	10
Data Entry Operator	38
Data Entry Supervisor	23
Data Security Analyst	2
Data Communications Manager	3
End User Computer Specialist	4
Information Center Specialist	17
Manager of System Development	23
PC Manager	6
PC Support Specialist	11
Programmer	51
Programmer Analyst	62
Programmer Trainee	24
Programmer Librarian	2
Project Leader	24
Project Manager	17
Quality Assurance Analyst	5
Senior Systems Analyst	21
Systems Analyst	29
Training Coordinator	7

From the titles identified above, it is clear to see that numerous job opportunities exist for operations, programming and systems. Many companies employ persons to assist end users in information centers or to specialize in the utilization of the

personal computer. The job titles also identify that there is indeed a career path for individuals to pursue if they have gained the appropriate educational background and/or gained work experience within the functional area of data processing and management information systems.

Job Titles Which Will Become a Part of the Information Systems Environment

By looking at job titles that are likely to become a part of the companies' employing opportunity, we are able to project the direction our educational programs should take in the future. As a result, the respondents were asked to identify job titles that they felt would become a part of their information systems environment in the next ten years. Table 5 details the results of this inquiry.

Table 5
FUTURE JOB TITLES IN RESPONDING ORGANIZATIONS

Job Title	Number
Application Consultant	10
Artificial Intelligence Analyst	14
Business Analyst	15
Connection Specialist	2
Data Operations Manager	17
Data Specialist	6
Data Base Designer	12
Development Center Specialist	3
Distributed Computing Specialist	6
Documents Management Specialist	6
4th Generation Language Specialist	14
Hardware Specialist	9
Local Area Network Specialist	25
Microcomputer Specialist	34
Network Specialist	21
Software Engineer	9
Systems Architect	6
Technology Analyst	9

From the results of this inquiry, it appears that heavier emphasis is going to be placed on data communications and microcomputers as integral parts of the data processing environment. Thirty nine companies identified that they would employ one or more employees in these job titles within the next year. Fifty four companies indicated that they will employ over 350 people in these different categories in the next five years.

Priority of Technical Courses Necessary for Preparing Students for Employment

The respondents were asked to prioritize the nine technical courses that they felt should be included in the operations/technical program cluster, the programming cluster, and the information systems program cluster. The priorities of 1 to 3 were categorized as high, 4 to 6 as medium priority and 7 to 9 as low priority. The findings were divided by cluster and organized to represent which courses were of importance in the preparation of a person as a technician or a supervisor in that particular program cluster. Tables 6 through 11 contain the priorities given by the respondents.

Priority of Technical Courses Necessary for Preparing Operations Technicians

The respondents identified a course in Console Operations as being the most important for the preparation of a operations technician. Fifty seven percent stated that a course in Console Operations was of high priority. A course in Computer Center Operations was given a high priority by 48.8 percent of the respondents. A course in Computer Information Systems, usually the introductory course, was given a high priority by 31 percent of the respondents. A course in Peripheral Equipment Operations was given a high priority by 23.8 percent of the respondents. A course in Data Retention, Use and Control was rated high by 13.1 percent of the respondents. Over ten percent also rated User Training and Support as a high priority. There was little agreement as to the priority of other technical courses in the preparation of technicians for job titles associated with operations as was indicated in Table 6.

Priority if Technical Courses Necessary for Preparing Operations/Technical Supervisors

Generally the respondents supported the priorities of technical courses for operations technicians when identifying those courses important for preparing supervisors in the operations/technical program cluster. However, only 23.8 percent of the respondents stated that a course in Console Operations was of high priority. Basically they agreed that a course in Computer Center Operations was important for both the technician and the supervisor. A higher percent felt that a knowledge of Data Retention, Use and Control was important in the preparation of a supervisor rather than the preparation of the technician of operations. Approximately an equal number indicated that user training was important for both the supervisor and technician. Table 7 contains the respondents' priorities.

TABLE 6
PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	41	48.8%	10	11.9%	7	8.3%	26	31.0%
Computer Information Systems	26	31.0%	16	19.0%	9	10.7%	33	39.3%
Console Operations	48	57.1%	9	10.7%	4	4.8%	23	27.4%
Database Management	3	3.6%	12	14.3%	11	13.1%	58	69.0%
Data Media Retention, Use and Control	11	13.1%	26	31.0%	10	11.9%	37	44.0%
Decision Support and Expert Systems	1	1.2%	3	3.6%	7	8.3%	73	86.9%
Intergrated Systems	0	0.0%	9	10.7%	9	10.7%	66	78.6%
Internships	7	8.3%	9	10.7%	11	13.1%	57	67.9%
Microcomputers In Business	4	4.8%	10	11.9%	14	16.7%	56	66.7%
Peripheral Equipment Operations	20	23.8%	24	28.6%	7	8.3%	33	39.3%
Programming Language -- Assembler	2	2.4%	0	0.0%	2	2.4%	80	95.2%
Programming Language -- BASIC	0	0.0%	2	2.4%	2	2.4%	80	95.2%
Programming Language -- C	0	0.0%	1	1.2%	1	1.2%	82	97.6%
Programming Language -- COBOL	2	2.4%	1	1.2%	0	0.0%	81	96.4%
Programming Language -- PL/I	0	0.0%	1	1.2%	1	1.2%	82	97.6%
Programming Language -- RPG II/III	4	4.8%	2	2.4%	3	3.6%	75	89.3%
Programming Language -- 4th Gen	2	2.4%	3	3.6%	2	2.4%	77	91.7%
Structured Programming Techniques	4	4.8%	2	2.4%	4	4.8%	74	88.1%
Systems Analysis and Design	3	3.6%	2	2.4%	3	3.6%	76	90.5%
Systems Software	5	6.0%	10	11.9%	15	17.9%	54	64.3%
Systems Applications	3	3.6%	10	11.9%	12	14.3%	59	70.2%
Telecommunication Concepts	7	8.3%	17	20.2%	23	27.4%	37	44.0%
User Training and Support	9	10.7%	15	17.9%	15	17.9%	45	53.6%
Other:	0	0.0%	0	0.0%	1	1.2%	83	98.8%

TABLE 7
PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	39	46.4%	8	9.5%	3	3.6%	34	40.5%
Computer Information Systems	28	33.3%	7	8.3%	8	9.5%	41	48.8%
Console Operations	20	23.8%	11	13.1%	13	15.5%	40	47.6%
Database Management	6	7.1%	10	11.9%	10	11.9%	58	69.0%
Data Media Retention, Use and Control	15	17.9%	19	22.6%	11	13.1%	39	46.4%
Decision Support and Expert Systems	1	1.2%	5	6.0%	3	3.6%	75	89.3%
Intergrated Systems	3	3.6%	7	8.3%	11	13.1%	63	75.0%
Internships	6	7.1%	2	2.4%	5	6.0%	71	84.5%
Microcomputers In Business	4	4.8%	7	8.3%	6	7.1%	67	79.8%
Peripheral Equipment Operations	7	8.3%	24	28.6%	8	9.5%	45	53.6%
Programming Language -- Assembler	0	0.0%	1	1.2%	0	0.0%	83	98.8%
Programming Language -- BASIC	0	0.0%	0	0.0%	1	1.2%	83	98.8%
Programming Language -- C	0	0.0%	0	0.0%	1	1.2%	83	98.8%
Programming Language -- COBOL	1	1.2%	1	1.2%	3	3.6%	79	94.0%
Programming Language -- PL/I	0	0.0%	1	1.2%	0	0.0%	83	98.8%
Programming Language -- RPG II/III	1	1.2%	3	3.6%	4	4.8%	76	90.5%
Programming Language -- 4th Gen	1	1.2%	1	1.2%	2	2.4%	80	95.2%
Structured Programming Techniques	3	3.6%	1	1.2%	3	3.6%	77	91.7%
Systems Analysis and Design	1	1.2%	4	4.8%	2	2.4%	77	91.7%
Systems Software	3	3.6%	12	14.3%	15	17.9%	54	64.3%
Systems Applications	5	6.0%	7	8.3%	11	13.1%	61	72.6%
Telecommunication Concepts	8	9.5%	14	16.7%	18	21.4%	44	52.4%
User Training and Support	10	11.9%	13	15.5%	11	13.1%	50	59.5%
Other:	0	0.0%	0	0.0%	0	0.0%	84	100.0%

Priority of Technical Course
Necessary for Preparing Programming Technicians

The following courses were listed as the highest priority for the preparation of a programming technician:

Structured Programming Techniques
Programming in RPG II/III
COBOL Programming
Systems Analysis and Design
Fourth Generation Programming Languages

Table 8 identifies the priorities set for the technician preparing for the programming cluster. Table 9 identifies the priorities set for the programming supervisors. Structured Programming Techniques ranked very high for programming technicians. One-third of the respondents indicated that the supervisors should have a knowledge of structured programming techniques. The respondents indicated that the supervisors of programming needed less knowledge of Programming in RPG II/III and COBOL than that needed by technicians. However, 36.9 percent of the respondents ranked Systems Analysis and Design as a high priority for supervisors compared to 29.8 percent ranking it high for technicians. Many of the respondents ranked Systems Applications and User Training and Support as a high priority for supervisors of programming. Database Management was ranked as a high or medium priority by over 35 percent of the respondents. Courses considered important for the operations technician and supervisor were generally considered to be of little importance to the programming technician and supervisor.

Priority of Technical Courses
Necessary for Preparing Students in the
Information Systems Program Cluster

Unlike the operations and programming clusters, the majority of the respondents did not give any specific technical course a high priority. However, several courses were categorized as high priority by many respondents. Tables 10 and 11 identify the rankings for technicians and supervisors of the information systems program cluster. Respondents ranked the following six courses as being the most important.

Systems Analysis and Design
Computer Information Systems
Database Management
User Training and Support
Integrated Systems
Microcomputers in Business

Systems Applications was ranked high for supervisors but not for the technicians. Generally the respondents indicated that the six courses listed above were of equal importance to the technician and the supervisor of information systems. The

TABLE 8
PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE PROGRAMMING CLUSTER

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	2	2.4%	3	3.6%	5	6.0%	74	88.1%
Computer Information Systems	8	9.5%	3	3.6%	9	10.7%	64	76.2%
Console Operations	1	1.2%	0	0.0%	3	3.6%	80	95.2%
Database Management	6	7.1%	23	27.4%	16	19.0%	39	46.4%
Data Media Retention, Use and Control	0	0.0%	0	0.0%	4	4.8%	80	95.2%
Decision Support and Expert Systems	1	1.2%	3	3.6%	9	10.7%	71	84.5%
Intergrated Systems	2	2.4%	12	14.3%	8	9.5%	62	73.8%
Internships	6	7.1%	4	4.8%	7	8.3%	67	79.8%
Microcomputers In Business	3	3.6%	8	9.5%	20	23.8%	53	63.1%
Peripheral Equipment Operations	0	0.0%	0	0.0%	4	4.8%	80	95.2%
Programming Language -- Assembler	6	7.1%	4	4.8%	5	6.0%	69	82.1%
Programming Language -- BASIC	5	6.0%	6	7.1%	5	6.0%	68	81.0%
Programming Language -- C	5	6.0%	2	2.4%	5	6.0%	72	85.7%
Programming Language -- COBOL	30	35.7%	8	9.5%	4	4.8%	42	50.0%
Programming Language -- PL/I	3	3.6%	2	2.4%	2	2.4%	77	91.7%
Programming Language -- RPG II/III	36	42.9%	8	9.5%	4	4.8%	36	42.9%
Programming Language -- 4th Gen	16	19.0%	11	13.1%	10	11.9%	47	56.0%
Structured Programming Techniques	41	48.8%	16	19.0%	6	7.1%	21	25.0%
Systems Analysis and Design	25	29.8%	26	31.0%	11	13.1%	22	26.2%
Systems Software	5	6.0%	16	19.0%	11	13.1%	52	61.9%
Systems Applications	7	8.3%	28	33.3%	13	15.5%	36	42.9%
Telecommunication Concepts	1	1.2%	9	10.7%	22	26.2%	52	61.9%
User Training and Support	3	3.6%	12	14.3%	16	19.0%	53	63.1%
Other:	0	0.0%	2	2.4%	0	0.0%	82	97.6%

TABLE 9
PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE PROGRAMMING CLUSTER

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	5	6.0%	5	6.0%	6	7.1%	68	81.0%
Computer Information Systems	9	10.7%	3	3.6%	8	9.5%	64	76.2%
Console Operations	1	1.2%	0	0.0%	0	0.0%	83	98.8%
Database Management	9	10.7%	14	16.7%	14	16.7%	47	56.0%
Data Media Retention, Use and Control	0	0.0%	2	2.4%	4	4.8%	78	92.9%
Decision Support and Expert Systems	2	2.4%	7	8.3%	9	10.7%	66	78.6%
Intergrated Systems	6	7.1%	7	8.3%	11	13.1%	60	71.4%
Internships	4	4.8%	2	2.4%	3	3.6%	75	89.3%
Microcomputers In Business	1	1.2%	12	14.3%	8	9.5%	63	75.0%
Peripheral Equipment Operations	0	0.0%	0	0.0%	1	1.2%	83	98.8%
Programming Language -- Assembler	5	6.0%	3	3.6%	3	3.6%	73	86.9%
Programming Language -- BASIC	3	3.6%	4	4.8%	4	4.8%	73	86.9%
Programming Language -- C	3	3.6%	1	1.2%	2	2.4%	78	92.9%
Programming Language -- COBOL	14	16.7%	8	9.5%	9	10.7%	53	63.1%
Programming Language -- PL/I	1	1.2%	1	1.2%	1	1.2%	81	96.4%
Programming Language -- RPG II/III	16	19.0%	8	9.5%	7	8.3%	53	63.1%
Programming Language -- 4th Gen	3	3.6%	11	13.1%	8	9.5%	62	73.8%
Structured Programming Techniques	28	33.3%	17	20.2%	3	3.6%	36	42.9%
Systems Analysis and Design	31	36.9%	14	16.7%	8	9.5%	31	36.9%
Systems Software	7	8.3%	10	11.9%	14	16.7%	53	63.1%
Systems Applications	15	17.9%	12	14.3%	14	16.7%	43	51.2%
Telecommunication Concepts	1	1.2%	16	19.0%	12	14.3%	55	65.5%
User Training and Support	10	11.9%	11	13.1%	13	15.5%	50	59.5%
Other:	0	0.0%	0	0.0%	0	0.0%	84	100.0%

TABLE 10
PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	5	6.0%	3	3.6%	2	2.4%	74	88.1%
Computer Information Systems	19	22.6%	6	7.1%	10	11.9%	49	58.3%
Console Operations	1	1.2%	2	2.4%	2	2.4%	79	94.0%
Database Management	16	19.0%	17	20.2%	5	6.0%	46	54.8%
Data Media Retention, Use and Control	1	1.2%	2	2.4%	6	7.1%	75	89.3%
Decision Support and Expert Systems	6	7.1%	9	10.7%	16	19.0%	53	63.1%
Intergrated Systems	15	17.9%	10	11.9%	13	15.5%	46	54.8%
Internships	6	7.1%	1	1.2%	7	8.3%	70	83.3%
Microcomputers In Business	12	14.3%	17	20.2%	11	13.1%	44	52.4%
Peripheral Equipment Operations	0	0.0%	4	4.8%	0	0.0%	80	95.2%
Programming Language -- Assembler	0	0.0%	1	1.2%	0	0.0%	83	98.8%
Programming Language -- BASIC	2	2.4%	4	4.8%	3	3.6%	75	89.3%
Programming Language -- C	2	2.4%	3	3.6%	3	3.6%	76	90.5%
Programming Language -- COBOL	7	8.3%	2	2.4%	4	4.8%	71	84.5%
Programming Language -- PL/I	0	0.0%	0	0.0%	2	2.4%	82	97.6%
Programming Language -- RPG II/III	6	7.1%	3	3.6%	3	3.6%	72	85.7%
Programming Language -- 4th Gen	6	7.1%	7	8.3%	5	6.0%	66	78.6%
Structured Programming Techniques	6	7.1%	11	13.1%	6	7.1%	61	72.6%
Systems Analysis and Design	22	26.2%	18	21.4%	8	9.5%	36	42.9%
Systems Software	8	9.5%	8	9.5%	6	7.1%	62	73.8%
Systems Applications	10	11.9%	20	23.8%	12	14.3%	42	50.0%
Telecommunication Concepts	8	9.5%	15	17.9%	15	17.9%	46	54.8%
User Training and Support	16	19.0%	11	13.1%	18	21.4%	39	46.4%
Other:	1	1.2%	0	0.0%	0	0.0%	83	98.8%

TABLE 11
PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	7	8.3%	3	3.6%	4	4.8%	70	83.3%
Computer Information Systems	24	28.6%	5	6.0%	8	9.5%	47	56.0%
Console Operations	3	3.6%	0	0.0%	1	1.2%	80	95.2%
Database Management	14	16.7%	17	20.2%	7	8.3%	46	54.8%
Data Media Retention, Use and Control	4	4.8%	2	2.4%	3	3.6%	75	89.3%
Decision Support and Expert Systems	8	9.5%	9	10.7%	17	20.2%	50	59.5%
Intergrated Systems	11	13.1%	14	16.7%	13	15.5%	46	54.8%
Internships	4	4.8%	3	3.6%	4	4.8%	73	86.9%
Microcomputers In Business	9	10.7%	21	25.0%	9	10.7%	45	53.6%
Peripheral Equipment Operations	0	0.0%	2	2.4%	4	4.8%	78	92.9%
Programming Language -- Assembler	0	0.0%	1	1.2%	1	1.2%	82	97.6%
Programming Language -- BASIC	0	0.0%	0	0.0%	3	3.6%	81	96.4%
Programming Language -- C	0	0.0%	1	1.2%	1	1.2%	82	97.6%
Programming Language -- COBOL	4	4.8%	2	2.4%	3	3.6%	75	89.3%
Programming Language -- PL/I	0	0.0%	0	0.0%	1	1.2%	83	98.8%
Programming Language -- RPG II/III	1	1.2%	3	3.6%	4	4.8%	76	90.5%
Programming Language -- 4th Gen	3	3.6%	6	7.1%	1	1.2%	74	88.1%
Structured Programming Techniques	5	6.0%	5	6.0%	5	6.0%	69	82.1%
Systems Analysis and Design	23	27.4%	18	21.4%	5	6.0%	38	45.2%
Systems Software	7	8.3%	9	10.7%	11	13.1%	57	67.9%
Systems Applications	11	13.1%	16	19.0%	13	15.5%	44	52.4%
Telecommunication Concepts	4	4.8%	11	13.1%	17	20.2%	52	61.9%
User Training and Support	18	21.4%	12	14.3%	10	11.9%	44	52.4%
Other:	0	0.0%	0	0.0%	0	0.0%	84	100.0%

respondents indicated that courses directed at operations and programming were of limited importance to persons in information systems.

Priority of Supportive Courses Necessary for Preparing Students for Employment

Respondents were asked to prioritize supportive course which they felt were most important for the preparation of technicians and supervisors in the operations, programming, and information systems program clusters. They were requested to prioritize the top four courses. The priorities were divided into priorities 1 and 2 as being high priority, and priorities 3 and 4 as being low priority for the purpose of analyzing the data. Tables 12 through 17 contained on the following pages indicate the respondents' priorities and also indicate the number and percentage that did not identify a specific course as a priority.

Priority of Supportive Courses Necessary for Preparing Technicians in the Operations/Technical Program Cluster

In Table 12, the priority of supportive courses most important in the preparation of an operations person is shown. Principles of Business was given a high priority by 40.5 percent of the respondents. Accounting Basics was the next course to be rated as a high priority with 34.5 percent of the respondents indicating so. Business Mathematics and Report Writing were also ranked as a high priority by over 23 percent of the respondents.

Priority of Supportive Courses Necessary for Preparing Supervisors in the Operations/Technical Program Cluster

The respondents generally indicated that the same supportive courses that were important for the technician were also important for the preparation of the supervisors. However, Principles of Supervision was ranked as a high priority by 36.9 percent of the respondents. Principles of Business, Report Writing, and Accounting Basics were also ranked as high priority. In contrast, the respondents indicated that Business Mathematics was not a high priority for supervisors in the operations/technical program cluster. Table 13 contains the tabulated results.

Priority of Supportive Courses Necessary for Preparing Technicians in the Programming Cluster

Table 14 contains the priorities identified for supportive courses necessary for preparing technician in the programming cluster. Similar to operations/technical, the respondents ranked Principles of Business as a high priority. Accounting Basics was ranked as a high priority by 31 percent and another 16.7 percent indicated that Accounting I was a high priority. Report Writing

TABLE 12

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER

SUPPORTIVE COURSES	Priority of Supportive Course				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	29	34.5%	16	19.0%	39	46.4%
Accounting I	9	10.7%	10	11.9%	65	77.4%
Accounting II	1	1.2%	6	7.1%	77	91.7%
Business Law	2	2.4%	4	4.8%	78	92.9%
Business Math	20	23.8%	17	20.2%	47	56.0%
Managerial Accounting	5	6.0%	7	8.3%	72	85.7%
Principles of Business	34	40.5%	20	23.8%	30	35.7%
Principles of Marketing	2	2.4%	4	4.8%	77	91.7%
Principles of Supervision	4	4.8%	13	15.5%	67	79.8%
Report Writing	20	23.8%	21	25.0%	43	51.2%
Other:	6	7.1%	6	7.1%	72	85.7%

TABLE 13

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER

SUPPORTIVE COURSES	Priority of Supportive Course				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	15	17.9%	17	20.2%	52	61.9%
Accounting I	7	8.3%	5	6.0%	72	85.7%
Accounting II	2	2.4%	2	2.4%	80	95.2%
Business Law	2	2.4%	1	1.2%	81	96.4%
Business Math	5	6.0%	9	10.7%	70	83.3%
Managerial Accounting	4	4.8%	7	8.3%	73	86.9%
Principles of Business	23	27.4%	21	25.0%	40	47.6%
Principles of Marketing	1	1.2%	4	4.8%	78	92.9%
Principles of Supervision	31	36.9%	20	23.8%	32	38.1%
Report Writing	18	21.4%	22	26.2%	44	52.4%
Other:	4	4.8%	2	2.4%	78	92.9%

TABLE 14
PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE PROGRAMMING CLUSTER

SUPPORTIVE COURSES	Priority of Supportive Course				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	26	31.0%	15	17.9%	43	51.2%
Accounting I	14	16.7%	11	13.1%	59	70.2%
Accounting II	6	7.1%	9	10.7%	69	82.1%
Business Law	1	1.2%	1	1.2%	82	97.6%
Business Math	18	21.4%	22	26.2%	44	52.4%
Managerial Accounting	5	6.0%	12	14.3%	67	79.8%
Principles of Business	30	35.7%	26	31.0%	28	33.3%
Principles of Marketing	3	3.6%	4	4.8%	77	91.7%
Principles of Supervision	6	7.1%	13	15.5%	65	77.4%
Report Writing	25	29.8%	18	21.4%	41	48.8%
Other:	6	7.1%	6	7.1%	72	85.7%

TABLE 15
PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE PROGRAMMING CLUSTER

SUPPORTIVE COURSES	Priority of Supportive Course				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	11	13.1%	14	16.7%	59	70.2%
Accounting I	5	6.0%	5	6.0%	74	88.1%
Accounting II	3	3.6%	2	2.4%	79	94.0%
Business Law	1	1.2%	1	1.2%	82	97.6%
Business Math	4	4.8%	10	11.9%	70	83.3%
Managerial Accounting	7	8.3%	14	16.7%	63	75.0%
Principles of Business	20	23.8%	23	27.4%	40	47.6%
Principles of Marketing	1	1.2%	6	7.1%	77	91.7%
Principles of Supervision	31	36.9%	20	23.8%	33	39.3%
Report Writing	26	31.0%	15	17.9%	43	51.2%
Other:	6	7.1%	2	2.4%	76	90.5%

was given a high priority by 29.8 percent of the respondents and 21.4 percent ranked Business Mathematics as a high priority.

Priority of Supportive Courses Necessary for Preparing Supervisors in the Programming Cluster

Accounting Basics, Principles of Business, Principles of Supervision, and Report Writing were all ranked as a high priority in the preparation of the supervisor of programming. It is interesting to note that the second course in accounting was not ranked as a high priority for preparing supervisors. Table 15 details the respondents' priorities for courses for supervisors.

Priority of Supportive Courses Necessary for Preparing Technicians in the Information Systems Cluster

Similar to the preparation of technicians in operations and programming, the respondents again ranked the same courses as high priority. Table 16 indicates the priorities given by the respondents. Principles of Business was ranked as a high priority by 38.1 percent of the respondents. Thirty one percent indicated that Report Writing was a high priority and 26.2 percent ranked Accounting Basics as a high priority.

Priority of Supportive Courses Necessary for Preparing Supervisors in the Information Systems Cluster

Table 17 contains the respondents priority of supportive courses for preparing supervisors of information systems. The same three courses given a high priority for the preparation of the technician were identified as high priority for preparing the supervisor. In addition, the respondents indicated that a course in Principles of Supervision was a high priority in preparing the supervisor of information systems.

Analysis of Data Based on the Number of Employees in the Company

The data set was subjected to analysis based upon the size of the company determined by the number of employees within the company. Analysis was conducted for companies with 1 to 99 employees, for companies with 100 to 499 employees, and for companies with 500 or more employees. The tables containing the analysis for each of the categories discussed previously in this report are contained in the appendix.

The analysis of this data indicated that there was no significant difference how respondents ranked courses for a company of 1 to 99 employees when compared to companies of 100 to

TABLE 16
PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE INFORMATION SYSTEM CLUSTER

SUPPORTIVE COURSES	Priority of Supportive Course				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	22	26.2%	13	15.5%	49	58.3%
Accounting I	5	6.0%	5	6.0%	74	88.1%
Accounting II	3	3.6%	3	3.6%	78	92.9%
Business Law	3	3.6%	5	6.0%	76	90.5%
Business Math	8	9.5%	14	16.7%	62	73.8%
Managerial Accounting	5	6.0%	15	17.9%	64	76.2%
Principles of Business	32	38.1%	19	22.6%	33	39.3%
Principles of Marketing	3	3.6%	9	10.7%	72	85.7%
Principles of Supervision	7	8.3%	10	11.9%	67	79.8%
Report Writing	26	31.0%	15	17.9%	43	51.2%
Other:	7	8.3%	5	6.0%	72	85.7%

TABLE 17
PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE INFORMATION SYSTEM CLUSTER

SUPPORTIVE COURSES	Priority of Supportive Course				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	10	11.9%	10	11.9%	64	76.2%
Accounting I	4	4.8%	4	4.8%	76	90.5%
Accounting II	2	2.4%	2	2.4%	80	95.2%
Business Law	3	3.6%	5	6.0%	76	90.5%
Business Math	4	4.8%	10	11.9%	70	83.3%
Managerial Accounting	6	7.1%	16	19.0%	62	73.8%
Principles of Business	29	34.5%	16	19.0%	38	45.2%
Principles of Marketing	3	3.6%	10	11.9%	71	84.5%
Principles of Supervision	31	36.9%	22	26.2%	31	36.9%
Report Writing	19	22.6%	17	20.2%	48	57.1%
Other:	5	6.0%	3	3.6%	76	90.5%

499 employees. This was also true when comparing the rankings with companies over 500 employees. This lack of significance existed in all six categories previously discussed.

Identification of Technical Courses for Preparing Students in Operations/Technical, Programming and Information Systems Clusters

Careful analysis of the data indicated that the respondents ranked the following courses as high priority in the preparation of employees in each of the categories.

Operations/Technical

Introduction to Computer Information Systems
Computer Center Operations
Console Operations
Peripheral Equipment Operations
Data Retention, Use and Control
User Training and Support

The course in User Training and Support was ranked as a high priority by a lower number of respondents. However, it appeared to be a course that many felt future employees should have.

Programming

Structured Programming Techniques
Programming in RPG II/III
Programming in COBOL
Fourth Generation Programming
Systems Analysis and Design

Lower emphasis was placed on the following courses. Yet, these courses appeared to be important in preparing programmers.

Database Management
User Training and Support
Microcomputers in Business
Systems Applications

Information Systems

The following courses were given the highest priority by respondents. Therefore, they should be included in the preparation of technicians and supervisors of information systems.

Systems Analysis and Design
Database Management
Integrated Systems
Microcomputers in Business
Systems Applications

Respondents indicated that the introductory course in Computer Information Systems was important for all three clusters.

When interpreting the data, the reader must take into consideration that typically it is the technician that eventually is promoted to supervisor. Therefore, it is important to note this when developing the overall curriculum. No data was collected to determine which career path an individual might take within the responding companies.

Identification of Supportive Courses for Preparing Students in the Operations/Technical, Programming, and Information Systems Clusters

Unlike the technical courses necessary for preparing persons for employment in the various clusters, the respondents generally indicated that the same supportive courses were necessary for preparing persons in all clusters. The courses are as follows:

Supportive Courses

Principles of Business
Accounting Basics
Report Writing
Business Mathematics
Accounting I
Principles of Supervision

The course entitled Principles of Supervision was given a high priority by respondents for the preparation of supervisors in all categories. The respondents did not, however, indicate that it was a high priority for preparing technicians. Again, if we anticipate that technicians are promoted to supervisors, we must consider this course in curriculum development.

The analysis of the data by company size based upon the number of employees revealed no significant difference in the ranking of supportive courses.

APPENDIX

TABLES BASED ON THE ANALYSIS OF DATA DETERMINED BY COMPANY SIZE

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	8	44.4%	1	5.6%	2	11.1%	7	38.9%
Computer Information Systems	7	38.9%	1	5.6%	0	0.0%	10	55.6%
Console Operations	9	50.0%	2	11.1%	1	5.6%	6	33.3%
Database Management	1	5.6%	5	27.8%	0	0.0%	12	66.7%
Data Media Retention, Use and Control	5	27.8%	4	22.2%	2	11.1%	7	38.9%
Decision Support and Expert Systems	0	0.0%	1	5.6%	2	11.1%	15	83.3%
Intergrated Systems	0	0.0%	4	22.2%	2	11.1%	12	66.7%
Internships	0	0.0%	3	16.7%	1	5.6%	14	77.8%
Microcomputers In Business	0	0.0%	2	11.1%	4	22.2%	12	66.7%
Peripheral Equipment Operations	5	27.8%	3	16.7%	0	0.0%	10	55.6%
Programming Language -- Assembler	1	5.6%	0	0.0%	0	0.0%	17	94.4%
Programming Language -- BASIC	0	0.0%	2	11.1%	0	0.0%	16	88.9%
Programming Language -- C	0	0.0%	1	5.6%	1	5.6%	16	88.9%
Programming Language -- COBOL	0	0.0%	1	5.6%	0	0.0%	17	94.4%
Programming Language -- PL/I	0	0.0%	0	0.0%	1	5.6%	17	94.4%
Programming Language -- RPG II/III	3	16.7%	0	0.0%	0	0.0%	15	83.3%
Programming Language -- 4th Gen	2	11.1%	2	11.1%	0	0.0%	14	77.8%
Structured Programming Techniques	1	5.6%	1	5.6%	2	11.1%	14	77.8%
Systems Analysis and Design	2	11.1%	1	5.6%	0	0.0%	15	83.3%
Systems Software	1	5.6%	1	5.6%	5	27.8%	11	61.1%
Systems Applications	0	0.0%	4	22.2%	3	16.7%	11	61.1%
Telecommunication Concepts	0	0.0%	2	11.1%	7	38.9%	9	50.0%
User Training and Support	0	0.0%	2	11.1%	5	27.8%	11	61.1%
Other:	0	0.0%	0	0.0%	1	5.6%	17	94.4%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	17	47.2%	5	13.9%	2	5.6%	12	33.3%
Computer Information Systems	13	36.1%	7	19.4%	4	11.1%	12	33.3%
Console Operations	20	55.6%	4	11.1%	2	5.6%	10	27.8%
Database Management	2	5.6%	3	8.3%	5	13.9%	26	72.2%
Data Media Retention, Use and Control	6	16.7%	10	27.8%	6	16.7%	14	38.9%
Decision Support and Expert Systems	0	0.0%	1	2.8%	4	11.1%	31	86.1%
Intergrated Systems	0	0.0%	3	8.3%	4	11.1%	29	80.6%
Internships	3	8.3%	4	11.1%	4	11.1%	25	69.4%
Microcomputers In Business	3	8.3%	5	13.9%	5	13.9%	23	63.9%
Peripheral Equipment Operations	4	11.1%	15	41.7%	5	13.9%	12	33.3%
Programming Language -- Assembler	0	0.0%	0	0.0%	1	2.8%	35	97.2%
Programming Language -- BASIC	0	0.0%	0	0.0%	1	2.8%	35	97.2%
Programming Language -- C	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Programming Language -- COBOL	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Programming Language -- PL/I	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Programming Language -- RPG II/III	1	2.8%	2	5.6%	1	2.8%	32	88.9%
Programming Language -- 4th Gen	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Structured Programming Techniques	2	5.6%	1	2.8%	2	5.6%	31	86.1%
Systems Analysis and Design	1	2.8%	0	0.0%	2	5.6%	33	91.7%
Systems Software	3	8.3%	4	11.1%	4	11.1%	25	69.4%
Systems Applications	2	5.6%	5	13.9%	6	16.7%	23	63.9%
Telecommunication Concepts	3	8.3%	5	13.9%	11	30.6%	17	47.2%
User Training and Support	5	13.9%	8	22.2%	6	16.7%	17	47.2%
Other:	0	0.0%	0	0.0%	0	0.0%	36	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	16	53.3%	4	13.3%	3	10.0%	7	23.3%
Computer Information Systems	6	20.0%	8	26.7%	5	16.7%	11	36.7%
Console Operations	19	63.3%	3	10.0%	1	3.3%	7	23.3%
Database Management	0	0.0%	4	13.3%	6	20.0%	20	66.7%
Data Media Retention, Use and Control	0	0.0%	12	40.0%	2	6.7%	16	53.3%
Decision Support and Expert Systems	1	3.3%	1	3.3%	1	3.3%	27	90.0%
Intergrated Systems	0	0.0%	2	6.7%	3	10.0%	25	83.3%
Internships	4	13.3%	2	6.7%	6	20.0%	18	60.0%
Microcomputers In Business	1	3.3%	3	10.0%	5	16.7%	21	70.0%
Peripheral Equipment Operations	11	36.7%	6	20.0%	2	6.7%	11	36.7%
Programming Language -- Assembler	1	3.3%	0	0.0%	1	3.3%	28	93.3%
Programming Language -- BASIC	0	0.0%	0	0.0%	1	3.3%	29	96.7%
Programming Language -- C	0	0.0%	0	0.0%	0	0.0%	30	100.0%
Programming Language -- COBOL	2	6.7%	0	0.0%	0	0.0%	28	93.3%
Programming Language -- PL/I	0	0.0%	1	3.3%	0	0.0%	29	96.7%
Programming Language -- RPG II/III	0	0.0%	0	0.0%	2	6.7%	28	93.3%
Programming Language -- 4th Gen	0	0.0%	1	3.3%	2	6.7%	27	90.0%
Structured Programming Techniques	1	3.3%	0	0.0%	0	0.0%	29	96.7%
Systems Analysis and Design	0	0.0%	1	3.3%	1	3.3%	28	93.3%
Systems Software	1	3.3%	5	16.7%	6	20.0%	18	60.0%
Systems Applications	1	3.3%	1	3.3%	3	10.0%	25	83.3%
Telecommunication Concepts	4	13.3%	10	33.3%	5	16.7%	11	36.7%
User Training and Support	4	13.3%	5	16.7%	4	13.3%	17	56.7%
Other:	0	0.0%	0	0.0%	0	0.0%	30	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	18	100.0%	0	0.0%	0	0.0%	0	0.0%
Computer Information Systems	8	44.4%	0	0.0%	1	5.6%	9	50.0%
Console Operations	4	22.2%	1	5.6%	1	5.6%	12	66.7%
Database Management	2	11.1%	2	11.1%	3	16.7%	11	61.1%
Data Media Retention, Use and Control	3	16.7%	1	5.6%	1	5.6%	13	72.2%
Decision Support and Expert Systems	3	16.7%	2	11.1%	2	11.1%	11	61.1%
Intergrated Systems	0	0.0%	1	5.6%	0	0.0%	17	94.4%
Internships	1	5.6%	1	5.6%	2	11.1%	14	77.8%
Microcomputers In Business	0	0.0%	0	0.0%	1	5.6%	17	94.4%
Peripheral Equipment Operations	0	0.0%	2	11.1%	0	0.0%	16	88.9%
Programming Language -- Assembler	0	0.0%	5	27.8%	1	5.6%	12	66.7%
Programming Language -- BASIC	0	0.0%	1	5.6%	0	0.0%	17	94.4%
Programming Language -- C	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- COBOL	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- PL/I	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- RPG II/III	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- 4th Gen	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Structured Programming Techniques	0	0.0%	1	5.6%	0	0.0%	17	94.4%
Systems Analysis and Design	0	0.0%	0	0.0%	2	11.1%	16	88.9%
Systems Software	0	0.0%	1	5.6%	1	5.6%	16	88.9%
Systems Applications	1	5.6%	3	16.7%	4	22.2%	10	55.6%
Telecommunication Concepts	0	0.0%	3	16.7%	2	11.1%	13	72.2%
User Training and Support	2	11.1%	1	5.6%	5	27.8%	10	55.6%
Other:	3	16.7%	2	11.1%	1	5.6%	12	66.7%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	17	47.2%	5	13.9%	1	2.8%	13	36.1%
Computer Information Systems	15	41.7%	3	8.3%	4	11.1%	14	38.9%
Console Operations	11	30.6%	1	2.8%	10	27.8%	14	38.9%
Database Management	3	8.3%	4	11.1%	2	5.6%	27	75.0%
Data Media Retention, Use and Control	7	19.4%	8	22.2%	7	19.4%	14	38.9%
Decision Support and Expert Systems	1	2.8%	3	8.3%	3	8.3%	29	80.6%
Intergrated Systems	1	2.8%	6	16.7%	4	11.1%	25	69.4%
Internships	3	8.3%	2	5.6%	2	5.6%	29	80.6%
Microcomputers In Business	3	8.3%	3	8.3%	5	13.9%	25	69.4%
Peripheral Equipment Operations	1	2.8%	11	30.6%	7	19.4%	17	47.2%
Programming Language -- Assembler	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Programming Language -- BASIC	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Programming Language -- C	0	0.0%	0	0.0%	1	2.8%	35	97.2%
Programming Language -- COBOL	0	0.0%	1	2.8%	1	2.8%	34	94.4%
Programming Language -- PL/I	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Programming Language -- RPG II/III	1	2.8%	2	5.6%	2	5.6%	31	86.1%
Programming Language -- 4th Gen	1	2.8%	0	0.0%	0	0.0%	35	97.2%
Structured Programming Techniques	2	5.6%	1	2.8%	1	2.8%	32	88.9%
Systems Analysis and Design	1	2.8%	2	5.6%	0	0.0%	33	91.7%
Systems Software	1	2.8%	5	13.9%	5	13.9%	25	69.4%
Systems Applications	3	8.3%	3	8.3%	6	16.7%	24	66.7%
Telecommunication Concepts	3	8.3%	7	19.4%	7	19.4%	19	52.8%
User Training and Support	4	11.1%	8	22.2%	4	11.1%	20	55.6%
Other:	0	0.0%	0	0.0%	0	0.0%	36	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	23	76.7%	7	23.3%	0	0.0%	0	0.0%
Computer Information Systems	14	46.7%	3	10.0%	1	3.3%	12	40.0%
Console Operations	9	30.0%	3	10.0%	3	10.0%	15	50.0%
Database Management	7	23.3%	8	26.7%	0	0.0%	15	50.0%
Data Media Retention, Use and Control	0	0.0%	5	16.7%	7	23.3%	18	60.0%
Decision Support and Expert Systems	5	16.7%	9	30.0%	2	6.7%	14	46.7%
Intergrated Systems	0	0.0%	1	3.3%	0	0.0%	29	96.7%
Internships	1	3.3%	0	0.0%	5	16.7%	24	80.0%
Microcomputers In Business	3	10.0%	0	0.0%	2	6.7%	25	83.3%
Peripheral Equipment Operations	1	3.3%	2	6.7%	1	3.3%	26	86.7%
Programming Language -- Assembler	6	20.0%	8	26.7%	0	0.0%	16	53.3%
Programming Language -- BASIC	0	0.0%	0	0.0%	0	0.0%	30	100.0%
Programming Language -- C	0	0.0%	0	0.0%	1	3.3%	29	96.7%
Programming Language -- COBOL	0	0.0%	0	0.0%	0	0.0%	30	100.0%
Programming Language -- PL/I	1	3.3%	0	0.0%	2	6.7%	27	90.0%
Programming Language -- RPG II/III	0	0.0%	1	3.3%	0	0.0%	29	96.7%
Programming Language -- 4th Gen	0	0.0%	1	3.3%	1	3.3%	28	93.3%
Structured Programming Techniques	0	0.0%	0	0.0%	2	6.7%	28	93.3%
Systems Analysis and Design	1	3.3%	0	0.0%	0	0.0%	29	96.7%
Systems Software	0	0.0%	1	3.3%	1	3.3%	28	93.3%
Systems Applications	1	3.3%	4	13.3%	6	20.0%	19	63.3%
Telecommunication Concepts	2	6.7%	1	3.3%	3	10.0%	24	80.0%
User Training and Support	3	10.0%	6	20.0%	6	20.0%	15	50.0%
Other:	3	10.0%	3	10.0%	6	20.0%	18	60.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Computer Information Systems	1	5.6%	0	0.0%	5	27.8%	12	66.7%
Console Operations	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Database Management	2	11.1%	4	22.2%	5	27.8%	7	38.9%
Data Media Retention, Use and Control	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Decision Support and Expert Systems	0	0.0%	1	5.6%	3	16.7%	14	77.8%
Intergrated Systems	0	0.0%	3	16.7%	2	11.1%	13	72.2%
Internships	1	5.6%	2	11.1%	2	11.1%	13	72.2%
Microcomputers In Business	1	5.6%	3	16.7%	5	27.8%	9	50.0%
Peripheral Equipment Operations	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- Assembler	2	11.1%	0	0.0%	1	5.6%	15	83.3%
Programming Language -- BASIC	0	0.0%	2	11.1%	0	0.0%	16	88.9%
Programming Language -- C	2	11.1%	2	11.1%	1	5.6%	13	72.2%
Programming Language -- COBOL	6	33.3%	1	5.6%	0	0.0%	11	61.1%
Programming Language -- PL/I	0	0.0%	0	0.0%	1	5.6%	17	94.4%
Programming Language -- RPG II/III	8	44.4%	1	5.6%	0	0.0%	9	50.0%
Programming Language -- 4th Gen	6	33.3%	4	22.2%	3	16.7%	5	27.8%
Structured Programming Techniques	9	50.0%	3	16.7%	0	0.0%	6	33.3%
Systems Analysis and Design	7	38.9%	5	27.8%	3	16.7%	3	16.7%
Systems Software	1	5.6%	2	11.1%	1	5.6%	14	77.8%
Systems Applications	2	11.1%	7	38.9%	3	16.7%	6	33.3%
Telecommunication Concepts	0	0.0%	1	5.6%	6	33.3%	11	61.1%
User Training and Support	0	0.0%	3	16.7%	1	5.6%	14	77.8%
Other:	0	0.0%	1	5.6%	0	0.0%	17	94.4%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	2	5.6%	3	8.3%	1	2.8%	30	83.3%
Computer Information Systems	4	11.1%	1	2.8%	1	2.8%	30	83.3%
Console Operations	1	2.8%	0	0.0%	2	5.6%	33	91.7%
Database Management	4	11.1%	7	19.4%	7	19.4%	18	50.0%
Data Media Retention, Use and Control	0	0.0%	0	0.0%	1	2.8%	35	97.2%
Decision Support and Expert Systems	0	0.0%	1	2.8%	3	8.3%	32	88.9%
Intergrated Systems	2	5.6%	5	13.9%	5	13.9%	24	66.7%
Internships	2	5.6%	1	2.8%	2	5.6%	31	86.1%
Microcomputers In Business	2	5.6%	3	8.3%	6	16.7%	25	69.4%
Peripheral Equipment Operations	0	0.0%	0	0.0%	4	11.1%	32	88.9%
Programming Language -- Assembler	2	5.6%	1	2.8%	3	8.3%	30	83.3%
Programming Language -- BASIC	5	13.9%	3	8.3%	3	8.3%	25	69.4%
Programming Language -- C	1	2.8%	0	0.0%	2	5.6%	33	91.7%
Programming Language -- COBOL	11	30.6%	3	8.3%	1	2.8%	21	58.3%
Programming Language -- PL/I	0	0.0%	1	2.8%	1	2.8%	34	94.4%
Programming Language -- RPG II/III	17	47.2%	5	13.9%	4	11.1%	10	27.8%
Programming Language -- 4th Gen	5	13.9%	3	8.3%	1	2.8%	27	75.0%
Structured Programming Techniques	14	38.9%	9	25.0%	4	11.1%	9	25.0%
Systems Analysis and Design	9	25.0%	11	30.6%	4	11.1%	12	33.3%
Systems Software	1	2.8%	8	22.2%	8	22.2%	19	52.8%
Systems Applications	4	11.1%	12	33.3%	6	16.7%	14	38.9%
Telecommunication Concepts	1	2.8%	3	8.3%	9	25.0%	23	63.9%
User Training and Support	1	2.8%	5	13.9%	8	22.2%	22	61.1%
Other:	0	0.0%	1	2.8%	0	0.0%	35	97.2%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	0	0.0%	0	0.0%	4	13.3%	26	86.7%
Computer Information Systems	3	10.0%	2	6.7%	3	10.0%	22	73.3%
Console Operations	0	0.0%	0	0.0%	1	3.3%	29	96.7%
Database Management	0	0.0%	12	40.0%	4	13.3%	14	46.7%
Data Media Retention, Use and Control	0	0.0%	0	0.0%	3	10.0%	27	90.0%
Decision Support and Expert Systems	1	3.3%	1	3.3%	3	10.0%	25	83.3%
Intergrated Systems	0	0.0%	4	13.3%	1	3.3%	25	83.3%
Internships	3	10.0%	1	3.3%	3	10.0%	23	76.7%
Microcomputers In Business	0	0.0%	2	6.7%	9	30.0%	19	63.3%
Peripheral Equipment Operations	0	0.0%	0	0.0%	0	0.0%	30	100.0%
Programming Language -- Assembler	2	6.7%	3	10.0%	1	3.3%	24	80.0%
Programming Language -- BASIC	0	0.0%	1	3.3%	2	6.7%	27	90.0%
Programming Language -- C	2	6.7%	0	0.0%	2	6.7%	26	86.7%
Programming Language -- COBOL	13	43.3%	4	13.3%	3	10.0%	10	33.3%
Programming Language -- PL/I	3	10.0%	1	3.3%	0	0.0%	26	86.7%
Programming Language -- RPG II/III	11	36.7%	2	6.7%	0	0.0%	17	56.7%
Programming Language -- 4th Gen	5	16.7%	4	13.3%	6	20.0%	15	50.0%
Structured Programming Techniques	18	60.0%	4	13.3%	2	6.7%	6	20.0%
Systems Analysis and Design	9	30.0%	10	33.3%	4	13.3%	7	23.3%
Systems Software	3	10.0%	6	20.0%	2	6.7%	19	63.3%
Systems Applications	1	3.3%	9	30.0%	4	13.3%	16	53.3%
Telecommunication Concepts	0	0.0%	5	16.7%	7	23.3%	18	60.0%
User Training and Support	2	6.7%	4	13.3%	7	23.3%	17	56.7%
Other:	0	0.0%	0	0.0%	0	0.0%	30	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	1	5.6%	0	0.0%	1	5.6%	16	88.9%
Computer Information Systems	2	11.1%	0	0.0%	2	11.1%	14	77.8%
Console Operations	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Database Management	1	5.6%	3	16.7%	5	27.8%	9	50.0%
Data Media Retention, Use and Control	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Decision Support and Expert Systems	0	0.0%	3	16.7%	2	11.1%	13	72.2%
Intergrated Systems	1	5.6%	0	0.0%	3	16.7%	14	77.8%
Internships	0	0.0%	0	0.0%	1	5.6%	17	94.4%
Microcomputers In Business	0	0.0%	2	11.1%	2	11.1%	14	77.8%
Peripheral Equipment Operations	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- Assembler	1	5.6%	1	5.6%	0	0.0%	16	88.9%
Programming Language -- BASIC	0	0.0%	1	5.6%	0	0.0%	17	94.4%
Programming Language -- C	1	5.6%	0	0.0%	1	5.6%	16	88.9%
Programming Language -- COBOL	0	0.0%	1	5.6%	3	16.7%	14	77.8%
Programming Language -- PL/I	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- RPG II/III	2	11.1%	2	11.1%	1	5.6%	13	72.2%
Programming Language -- 4th Gen	0	0.0%	3	16.7%	3	16.7%	12	66.7%
Structured Programming Techniques	4	22.2%	5	27.8%	0	0.0%	9	50.0%
Systems Analysis and Design	10	55.6%	1	5.6%	0	0.0%	7	38.9%
Systems Software	3	16.7%	2	11.1%	1	5.6%	12	66.7%
Systems Applications	7	38.9%	1	5.6%	1	5.6%	9	50.0%
Telecommunication Concepts	0	0.0%	4	22.2%	2	11.1%	12	66.7%
User Training and Support	1	5.6%	2	11.1%	1	5.6%	14	77.8%
Other:	0	0.0%	0	0.0%	0	0.0%	18	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	4	11.1%	3	8.3%	0	0.0%	29	80.6%
Computer Information Systems	5	13.9%	0	0.0%	4	11.1%	27	75.0%
Console Operations	1	2.8%	0	0.0%	0	0.0%	35	97.2%
Database Management	7	19.4%	6	16.7%	4	11.1%	19	52.8%
Data Media Retention, Use and Control	0	0.0%	2	5.6%	2	5.6%	32	88.9%
Decision Support and Expert Systems	2	5.6%	3	8.3%	5	13.9%	26	72.2%
Intergrated Systems	4	11.1%	5	13.9%	5	13.9%	22	61.1%
Internships	2	5.6%	1	2.8%	1	2.8%	32	88.9%
Microcomputers In Business	1	2.8%	4	11.1%	3	8.3%	28	77.8%
Peripheral Equipment Operations	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Programming Language -- Assembler	1	2.8%	1	2.8%	3	8.3%	31	86.1%
Programming Language -- BASIC	3	8.3%	2	5.6%	3	8.3%	28	77.8%
Programming Language -- C	1	2.8%	1	2.8%	1	2.8%	33	91.7%
Programming Language -- COBOL	6	16.7%	4	11.1%	4	11.1%	22	61.1%
Programming Language -- PL/I	0	0.0%	1	2.8%	1	2.8%	34	94.4%
Programming Language -- RPG II/III	10	27.8%	5	13.9%	5	13.9%	16	44.4%
Programming Language -- 4th Gen	2	5.6%	4	11.1%	1	2.8%	29	80.6%
Structured Programming Techniques	12	33.3%	7	19.4%	2	5.6%	15	41.7%
Systems Analysis and Design	12	33.3%	8	22.2%	4	11.1%	12	33.3%
Systems Software	2	5.6%	5	13.9%	7	19.4%	22	61.1%
Systems Applications	4	11.1%	7	19.4%	8	22.2%	17	47.2%
Telecommunication Concepts	1	2.8%	6	16.7%	5	13.9%	24	66.7%
User Training and Support	3	8.3%	5	13.9%	10	27.8%	18	50.0%
Other:	0	0.0%	0	0.0%	0	0.0%	36	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	0	0.0%	2	6.7%	5	16.7%	23	76.7%
Computer Information Systems	2	6.7%	3	10.0%	2	6.7%	23	76.7%
Console Operations	0	0.0%	0	0.0%	0	0.0%	30	100.0%
Database Management	1	3.3%	5	16.7%	5	16.7%	19	63.3%
Data Media Retention, Use and Control	0	0.0%	0	0.0%	2	6.7%	28	93.3%
Decision Support and Expert Systems	0	0.0%	1	3.3%	2	6.7%	27	90.0%
Intergrated Systems	1	3.3%	2	6.7%	3	10.0%	24	80.0%
Internships	2	6.7%	1	3.3%	1	3.3%	26	86.7%
Microcomputers In Business	0	0.0%	6	20.0%	3	10.0%	21	70.0%
Peripheral Equipment Operations	0	0.0%	0	0.0%	1	3.3%	29	96.7%
Programming Language -- Assembler	3	10.0%	1	3.3%	0	0.0%	26	86.7%
Programming Language -- BASIC	0	0.0%	1	3.3%	1	3.3%	28	93.3%
Programming Language -- C	1	3.3%	0	0.0%	0	0.0%	29	96.7%
Programming Language -- COBOL	8	26.7%	3	10.0%	2	6.7%	17	56.7%
Programming Language -- PL/I	1	3.3%	0	0.0%	0	0.0%	29	96.7%
Programming Language -- RPG II/III	4	13.3%	1	3.3%	1	3.3%	24	80.0%
Programming Language -- 4th Gen	1	3.3%	4	13.3%	4	13.3%	21	70.0%
Structured Programming Techniques	12	40.0%	5	16.7%	1	3.3%	12	40.0%
Systems Analysis and Design	9	30.0%	5	16.7%	4	13.3%	12	40.0%
Systems Software	2	6.7%	3	10.0%	6	20.0%	19	63.3%
Systems Applications	4	13.3%	4	13.3%	5	16.7%	17	56.7%
Telecommunication Concepts	0	0.0%	6	20.0%	5	16.7%	19	63.3%
User Training and Support	6	20.0%	4	13.3%	2	6.7%	18	60.0%
Other:	0	0.0%	0	0.0%	0	0.0%	30	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	1	5.6%	1	5.6%	0	0.0%	16	88.9%
Computer Information Systems	3	16.7%	2	11.1%	1	5.6%	12	66.7%
Console Operations	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Database Management	4	22.2%	5	27.8%	0	0.0%	9	50.0%
Data Media Retention, Use and Control	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Decision Support and Expert Systems	1	5.6%	3	16.7%	3	16.7%	11	61.1%
Intergrated Systems	0	0.0%	4	22.2%	2	11.1%	12	66.7%
Internships	0	0.0%	0	0.0%	2	11.1%	16	88.9%
Microcomputers In Business	3	16.7%	2	11.1%	2	11.1%	11	61.1%
Peripheral Equipment Operations	0	0.0%	1	5.6%	0	0.0%	17	94.4%
Programming Language -- Assembler	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- BASIC	1	5.6%	1	5.6%	1	5.6%	15	83.3%
Programming Language -- C	1	5.6%	1	5.6%	2	11.1%	14	77.8%
Programming Language -- COBOL	1	5.6%	0	0.0%	1	5.6%	16	88.9%
Programming Language -- PL/I	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- RPG II/III	1	5.6%	0	0.0%	1	5.6%	16	88.9%
Programming Language -- 4th Gen	3	16.7%	1	5.6%	1	5.6%	13	72.2%
Structured Programming Techniques	0	0.0%	3	16.7%	0	0.0%	15	83.3%
Systems Analysis and Design	3	16.7%	3	16.7%	3	16.7%	9	50.0%
Systems Software	2	11.1%	1	5.6%	1	5.6%	14	77.8%
Systems Applications	4	22.2%	2	11.1%	1	5.6%	11	61.1%
Telecommunication Concepts	1	5.6%	0	0.0%	4	22.2%	13	72.2%
User Training and Support	3	16.7%	2	11.1%	3	16.7%	10	55.6%
Other:	0	0.0%	0	0.0%	0	0.0%	18	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	3	8.3%	1	2.8%	0	0.0%	32	88.9%
Computer Information Systems	10	27.8%	2	5.6%	5	13.9%	19	52.8%
Console Operations	0	0.0%	1	2.8%	2	5.6%	33	91.7%
Database Management	7	19.4%	6	16.7%	2	5.6%	21	58.3%
Data Media Retention, Use and Control	1	2.8%	1	2.8%	5	13.9%	29	80.6%
Decision Support and Expert Systems	2	5.6%	1	2.8%	8	22.2%	25	69.4%
Intergrated Systems	9	25.0%	1	2.8%	6	16.7%	20	55.6%
Internships	2	5.6%	0	0.0%	2	5.6%	32	88.9%
Microcomputers In Business	3	8.3%	5	13.9%	5	13.9%	23	63.9%
Peripheral Equipment Operations	0	0.0%	1	2.8%	0	0.0%	35	97.2%
Programming Language -- Assembler	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Programming Language -- BASIC	1	2.8%	1	2.8%	2	5.6%	32	88.9%
Programming Language -- C	0	0.0%	0	0.0%	1	2.8%	35	97.2%
Programming Language -- COBOL	2	5.6%	0	0.0%	2	5.6%	32	88.9%
Programming Language -- PL/I	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Programming Language -- RPG II/III	3	8.3%	2	5.6%	0	0.0%	31	86.1%
Programming Language -- 4th Gen	1	2.8%	1	2.8%	0	0.0%	34	94.4%
Structured Programming Techniques	5	13.9%	4	11.1%	2	5.6%	25	69.4%
Systems Analysis and Design	7	19.4%	9	25.0%	2	5.6%	18	50.0%
Systems Software	2	5.6%	5	13.9%	2	5.6%	27	75.0%
Systems Applications	3	8.3%	11	30.6%	6	16.7%	16	44.4%
Telecommunication Concepts	1	2.8%	10	27.8%	6	16.7%	19	52.8%
User Training and Support	5	13.9%	7	19.4%	6	16.7%	18	50.0%
Other:	1	2.8%	0	0.0%	0	0.0%	35	97.2%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	1	3.3%	1	3.3%	2	6.7%	26	86.7%
Computer Information Systems	6	20.0%	2	6.7%	4	13.3%	18	60.0%
Console Operations	1	3.3%	1	3.3%	0	0.0%	28	93.3%
Database Management	5	16.7%	6	20.0%	3	10.0%	16	53.3%
Data Media Retention, Use and Control	0	0.0%	1	3.3%	1	3.3%	28	93.3%
Decision Support and Expert Systems	3	10.0%	5	16.7%	5	16.7%	17	56.7%
Intergrated Systems	6	20.0%	5	16.7%	5	16.7%	14	46.7%
Internships	4	13.3%	1	3.3%	3	10.0%	22	73.3%
Microcomputers In Business	6	20.0%	10	33.3%	4	13.3%	10	33.3%
Peripheral Equipment Operations	0	0.0%	2	6.7%	0	0.0%	28	93.3%
Programming Language -- Assembler	0	0.0%	1	3.3%	0	0.0%	29	96.7%
Programming Language -- BASIC	0	0.0%	2	6.7%	0	0.0%	28	93.3%
Programming Language -- C	1	3.3%	2	6.7%	0	0.0%	27	90.0%
Programming Language -- COBOL	4	13.3%	2	6.7%	1	3.3%	23	76.7%
Programming Language -- PL/I	0	0.0%	0	0.0%	2	6.7%	28	93.3%
Programming Language -- RPG II/III	2	6.7%	1	3.3%	2	6.7%	25	83.3%
Programming Language -- 4th Gen	2	6.7%	5	16.7%	4	13.3%	19	63.3%
Structured Programming Techniques	1	3.3%	4	13.3%	4	13.3%	21	70.0%
Systems Analysis and Design	12	40.0%	6	20.0%	3	10.0%	9	30.0%
Systems Software	4	13.3%	2	6.7%	3	10.0%	21	70.0%
Systems Applications	3	10.0%	7	23.3%	5	16.7%	15	50.0%
Telecommunication Concepts	6	20.0%	5	16.7%	5	16.7%	14	46.7%
User Training and Support	8	26.7%	2	6.7%	9	30.0%	11	36.7%
Other:	0	0.0%	0	0.0%	0	0.0%	30	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	1	5.6%	0	0.0%	1	5.6%	16	88.9%
Computer Information Systems	3	16.7%	2	11.1%	0	0.0%	13	72.2%
Console Operations	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Database Management	1	5.6%	4	22.2%	2	11.1%	11	61.1%
Data Media Retention, Use and Control	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Decision Support and Expert Systems	0	0.0%	4	22.2%	2	11.1%	12	66.7%
Intergrated Systems	1	5.6%	4	22.2%	1	5.6%	12	66.7%
Internships	0	0.0%	1	5.6%	0	0.0%	17	94.4%
Microcomputers In Business	3	16.7%	1	5.6%	5	27.8%	9	50.0%
Peripheral Equipment Operations	0	0.0%	0	0.0%	2	11.1%	16	88.9%
Programming Language -- Assembler	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- BASIC	0	0.0%	0	0.0%	1	5.6%	17	94.4%
Programming Language -- C	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- COBOL	0	0.0%	0	0.0%	1	5.6%	17	94.4%
Programming Language -- PL/I	0	0.0%	0	0.0%	0	0.0%	18	100.0%
Programming Language -- RPG II/III	0	0.0%	0	0.0%	1	5.6%	17	94.4%
Programming Language -- 4th Gen	0	0.0%	0	0.0%	1	5.6%	17	94.4%
Structured Programming Techniques	1	5.6%	1	5.6%	1	5.6%	15	83.3%
Systems Analysis and Design	5	27.8%	2	11.1%	0	0.0%	11	61.1%
Systems Software	2	11.1%	3	16.7%	2	11.1%	11	61.1%
Systems Applications	6	33.3%	1	5.6%	0	0.0%	11	61.1%
Telecommunication Concepts	1	5.6%	2	11.1%	2	11.1%	13	72.2%
User Training and Support	4	22.2%	2	11.1%	1	5.6%	11	61.1%
Other:	0	0.0%	0	0.0%	0	0.0%	18	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	5	13.9%	1	2.8%	2	5.6%	28	77.8%
Computer Information Systems	15	41.7%	2	5.6%	4	11.1%	15	41.7%
Console Operations	2	5.6%	0	0.0%	1	2.8%	33	91.7%
Database Management	8	22.2%	6	16.7%	4	11.1%	18	50.0%
Data Media Retention, Use and Control	3	8.3%	0	0.0%	3	8.3%	30	83.3%
Decision Support and Expert Systems	4	11.1%	2	5.6%	8	22.2%	22	61.1%
Intergrated Systems	7	19.4%	7	19.4%	6	16.7%	16	44.4%
Internships	2	5.6%	0	0.0%	2	5.6%	32	88.9%
Microcomputers In Business	3	8.3%	10	27.8%	3	8.3%	20	55.6%
Peripheral Equipment Operations	0	0.0%	0	0.0%	2	5.6%	34	94.4%
Programming Language -- Assembler	0	0.0%	0	0.0%	1	2.8%	35	97.2%
Programming Language -- BASIC	0	0.0%	0	0.0%	2	5.6%	34	94.4%
Programming Language -- C	0	0.0%	0	0.0%	1	2.8%	35	97.2%
Programming Language -- COBOL	0	0.0%	0	0.0%	1	2.8%	35	97.2%
Programming Language -- PL/I	0	0.0%	0	0.0%	0	0.0%	36	100.0%
Programming Language -- RPG II/III	1	2.8%	3	8.3%	2	5.6%	30	83.3%
Programming Language -- 4th Gen	0	0.0%	1	2.8%	0	0.0%	35	97.2%
Structured Programming Techniques	2	5.6%	2	5.6%	3	8.3%	29	80.6%
Systems Analysis and Design	9	25.0%	8	22.2%	2	5.6%	17	47.2%
Systems Software	2	5.6%	4	11.1%	6	16.7%	24	66.7%
Systems Applications	3	8.3%	10	27.8%	6	16.7%	17	47.2%
Telecommunication Concepts	1	2.8%	8	22.2%	7	19.4%	20	55.6%
User Training and Support	5	13.9%	9	25.0%	3	8.3%	19	52.8%
Other:	0	0.0%	0	0.0%	0	0.0%	36	100.0%

PRIORITY OF TECHNICAL COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

TECHNICAL COURSES	Respondents Priority of Technical Courses						Nonrespondents	
	High		Medium		Low			
	Number	%	Number	%	Number	%	Number	%
Computer Center Operations	1	3.3%	2	6.7%	1	3.3%	26	86.7%
Computer Information Systems	6	20.0%	1	3.3%	4	13.3%	19	63.3%
Console Operations	1	3.3%	0	0.0%	0	0.0%	29	96.7%
Database Management	5	16.7%	7	23.3%	1	3.3%	17	56.7%
Data Media Retention, Use and Control	1	3.3%	2	6.7%	0	0.0%	27	90.0%
Decision Support and Expert Systems	4	13.3%	3	10.0%	7	23.3%	16	53.3%
Intergrated Systems	3	10.0%	3	10.0%	6	20.0%	18	60.0%
Internships	2	6.7%	2	6.7%	2	6.7%	24	80.0%
Microcomputers In Business	3	10.0%	10	33.3%	1	3.3%	16	53.3%
Peripheral Equipment Operations	0	0.0%	2	6.7%	0	0.0%	28	93.3%
Programming Language -- Assembler	0	0.0%	1	3.3%	0	0.0%	29	96.7%
Programming Language -- BASIC	0	0.0%	0	0.0%	0	0.0%	30	100.0%
Programming Language -- C	0	0.0%	1	3.3%	0	0.0%	29	96.7%
Programming Language -- COBOL	4	13.3%	2	6.7%	1	3.3%	23	76.7%
Programming Language -- PL/I	0	0.0%	0	0.0%	1	3.3%	29	96.7%
Programming Language -- RPG II/III	0	0.0%	0	0.0%	1	3.3%	29	96.7%
Programming Language -- 4th Gen	3	10.0%	5	16.7%	0	0.0%	22	73.3%
Structured Programming Techniques	2	6.7%	2	6.7%	1	3.3%	25	83.3%
Systems Analysis and Design	9	30.0%	8	26.7%	3	10.0%	10	33.3%
Systems Software	3	10.0%	2	6.7%	3	10.0%	22	73.3%
Systems Applications	2	6.7%	5	16.7%	7	23.3%	16	53.3%
Telecommunication Concepts	2	6.7%	1	3.3%	8	26.7%	19	63.3%
User Training and Support	9	30.0%	1	3.3%	6	20.0%	14	46.7%
Other:	0	0.0%	0	0.0%	0	0.0%	30	100.0%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	2	11.1%	5	27.8%	11	61.1%
Accounting I	1	5.6%	3	16.7%	14	77.8%
Accounting II	0	0.0%	1	5.6%	17	94.4%
Business Law	0	0.0%	3	16.7%	15	83.3%
Business Math	5	27.8%	3	16.7%	10	55.6%
Managerial Accounting	2	11.1%	2	11.1%	14	77.8%
Principles of Business	9	50.0%	2	11.1%	7	38.9%
Principles of Marketing	2	11.1%	1	5.6%	15	83.3%
Principles of Supervision	1	5.6%	2	11.1%	15	83.3%
Report Writing	6	33.3%	4	22.2%	8	44.4%
Other:	0	0.0%	2	11.1%	16	88.9%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	17	47.2%	3	8.3%	16	44.4%
Accounting I	5	13.9%	3	8.3%	28	77.8%
Accounting II	0	0.0%	3	8.3%	33	91.7%
Business Law	0	0.0%	0	0.0%	36	100.0%
Business Math	8	22.2%	7	19.4%	21	58.3%
Managerial Accounting	2	5.6%	1	2.8%	33	91.7%
Principles of Business	15	41.7%	9	25.0%	12	33.3%
Principles of Marketing	0	0.0%	1	2.8%	35	97.2%
Principles of Supervision	1	2.8%	9	25.0%	26	72.2%
Report Writing	5	13.9%	10	27.8%	21	58.3%
Other:	2	5.6%	4	11.1%	30	83.3%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	10	33.3%	8	26.7%	12	40.0%
Accounting I	3	10.0%	4	13.3%	23	76.7%
Accounting II	1	3.3%	2	6.7%	27	90.0%
Business Law	2	6.7%	1	3.3%	27	90.0%
Business Math	7	23.3%	7	23.3%	16	53.3%
Managerial Accounting	1	3.3%	4	13.3%	25	83.3%
Principles of Business	10	33.3%	9	30.0%	11	36.7%
Principles of Marketing	0	0.0%	2	6.7%	28	93.3%
Principles of Supervision	2	6.7%	2	6.7%	26	86.7%
Report Writing	9	30.0%	7	23.3%	14	46.7%
Other:	4	13.3%	0	0.0%	26	86.7%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	0	0.0%	4	22.2%	14	77.8%
Accounting I	0	0.0%	1	5.6%	17	94.4%
Accounting II	0	0.0%	1	5.6%	17	94.4%
Business Law	0	0.0%	1	5.6%	17	94.4%
Business Math	1	5.6%	1	5.6%	16	88.9%
Managerial Accounting	0	0.0%	2	11.1%	16	88.9%
Principles of Business	3	16.7%	2	11.1%	13	72.2%
Principles of Marketing	0	0.0%	1	5.6%	17	94.4%
Principles of Supervision	7	38.9%	2	11.1%	9	50.0%
Report Writing	7	38.9%	2	11.1%	9	50.0%
Other:	0	0.0%	1	5.6%	17	94.4%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	11	30.6%	6	16.7%	19	52.8%
Accounting I	4	11.1%	3	8.3%	29	80.6%
Accounting II	1	2.8%	1	2.8%	34	94.4%
Business Law	0	0.0%	0	0.0%	36	100.0%
Business Math	4	11.1%	3	8.3%	29	80.6%
Managerial Accounting	2	5.6%	1	2.8%	33	91.7%
Principles of Business	12	33.3%	11	30.6%	13	36.1%
Principles of Marketing	0	0.0%	3	8.3%	33	91.7%
Principles of Supervision	11	30.6%	11	30.6%	14	38.9%
Report Writing	5	13.9%	12	33.3%	19	52.8%
Other:	2	5.6%	1	2.8%	33	91.7%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE OPERATIONS/TECHNICAL PROGRAM CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	4	13.3%	7	23.3%	19	63.3%
Accounting I	3	10.0%	1	3.3%	26	86.7%
Accounting II	1	3.3%	0	0.0%	29	96.7%
Business Law	2	6.7%	0	0.0%	28	93.3%
Business Math	0	0.0%	5	16.7%	25	83.3%
Managerial Accounting	2	6.7%	4	13.3%	24	80.0%
Principles of Business	8	26.7%	8	26.7%	14	46.7%
Principles of Marketing	1	3.3%	0	0.0%	29	96.7%
Principles of Supervision	13	43.3%	7	23.3%	10	33.3%
Report Writing	6	20.0%	8	26.7%	16	53.3%
Other:	2	6.7%	0	0.0%	28	93.3%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	3	16.7%	4	22.2%	11	61.1%
Accounting I	5	27.8%	0	0.0%	13	72.2%
Accounting II	2	11.1%	6	33.3%	10	55.6%
Business Law	0	0.0%	1	5.6%	17	94.4%
Business Math	4	22.2%	2	11.1%	12	66.7%
Managerial Accounting	2	11.1%	4	22.2%	12	66.7%
Principles of Business	5	27.8%	5	27.8%	8	44.4%
Principles of Marketing	2	11.1%	2	11.1%	14	77.8%
Principles of Supervision	2	11.1%	2	11.1%	14	77.8%
Report Writing	5	27.8%	2	11.1%	11	61.1%
Other:	0	0.0%	2	11.1%	16	88.9%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	13	36.1%	5	13.9%	18	50.0%
Accounting I	6	16.7%	5	13.9%	25	69.4%
Accounting II	2	5.6%	2	5.6%	32	88.9%
Business Law	0	0.0%	0	0.0%	36	100.0%
Business Math	8	22.2%	10	27.8%	18	50.0%
Managerial Accounting	2	5.6%	4	11.1%	30	83.3%
Principles of Business	15	41.7%	12	33.3%	9	25.0%
Principles of Marketing	1	2.8%	1	2.8%	34	94.4%
Principles of Supervision	2	5.6%	7	19.4%	27	75.0%
Report Writing	9	25.0%	9	25.0%	18	50.0%
Other:	2	5.6%	3	8.3%	31	86.1%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	10	33.3%	6	20.0%	14	46.7%
Accounting I	3	10.0%	6	20.0%	21	70.0%
Accounting II	2	6.7%	1	3.3%	27	90.0%
Business Law	1	3.3%	0	0.0%	29	96.7%
Business Math	6	20.0%	10	33.3%	14	46.7%
Managerial Accounting	1	3.3%	4	13.3%	25	83.3%
Principles of Business	10	33.3%	9	30.0%	11	36.7%
Principles of Marketing	0	0.0%	1	3.3%	29	96.7%
Principles of Supervision	2	6.7%	4	13.3%	24	80.0%
Report Writing	11	36.7%	7	23.3%	12	40.0%
Other:	4	13.3%	1	3.3%	25	83.3%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	0	0.0%	1	5.6%	17	94.4%
Accounting I	0	0.0%	1	5.6%	17	94.4%
Accounting II	1	5.6%	0	0.0%	17	94.4%
Business Law	0	0.0%	1	5.6%	17	94.4%
Business Math	0	0.0%	2	11.1%	16	88.9%
Managerial Accounting	1	5.6%	4	22.2%	13	72.2%
Principles of Business	3	16.7%	3	16.7%	12	66.7%
Principles of Marketing	0	0.0%	3	16.7%	15	83.3%
Principles of Supervision	6	33.3%	3	16.7%	9	50.0%
Report Writing	8	44.4%	2	11.1%	8	44.4%
Other:	1	5.6%	0	0.0%	17	94.4%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	9	25.0%	6	16.7%	21	58.3%
Accounting I	3	8.3%	3	8.3%	30	83.3%
Accounting II	0	0.0%	1	2.8%	35	97.2%
Business Law	0	0.0%	0	0.0%	36	100.0%
Business Math	3	8.3%	5	13.9%	28	77.8%
Managerial Accounting	3	8.3%	5	13.9%	28	77.8%
Principles of Business	10	27.8%	10	27.8%	16	44.4%
Principles of Marketing	1	2.8%	3	8.3%	32	88.9%
Principles of Supervision	14	38.9%	9	25.0%	13	36.1%
Report Writing	9	25.0%	10	27.8%	17	47.2%
Other:	2	5.6%	1	2.8%	33	91.7%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE PROGRAMMING CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	2	6.7%	7	23.3%	21	70.0%
Accounting I	2	6.7%	1	3.3%	27	90.0%
Accounting II	2	6.7%	1	3.3%	27	90.0%
Business Law	1	3.3%	0	0.0%	29	96.7%
Business Math	1	3.3%	3	10.0%	26	86.7%
Managerial Accounting	3	10.0%	5	16.7%	22	73.3%
Principles of Business	7	23.3%	10	33.3%	13	43.3%
Principles of Marketing	0	0.0%	0	0.0%	30	100.0%
Principles of Supervision	11	36.7%	8	26.7%	11	36.7%
Report Writing	9	30.0%	3	10.0%	18	60.0%
Other:	3	10.0%	1	3.3%	26	86.7%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	1	5.6%	3	16.7%	14	77.8%
Accounting I	0	0.0%	0	0.0%	18	100.0%
Accounting II	1	5.6%	0	0.0%	17	94.4%
Business Law	0	0.0%	1	5.6%	17	94.4%
Business Math	0	0.0%	1	5.6%	17	94.4%
Managerial Accounting	2	11.1%	3	16.7%	13	72.2%
Principles of Business	5	27.8%	5	27.8%	8	44.4%
Principles of Marketing	1	5.6%	4	22.2%	13	72.2%
Principles of Supervision	4	22.2%	2	11.1%	12	66.7%
Report Writing	7	38.9%	1	5.6%	10	55.6%
Other:	1	5.6%	0	0.0%	17	94.4%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	13	36.1%	6	16.7%	17	47.2%
Accounting I	6	16.7%	4	11.1%	26	72.2%
Accounting II	7	19.4%	1	2.8%	28	77.8%
Business Law	5	13.9%	4	11.1%	27	75.0%
Business Math	4	11.1%	7	19.4%	25	69.4%
Managerial Accounting	2	5.6%	4	11.1%	30	83.3%
Principles of Business	16	44.4%	5	13.9%	15	41.7%
Principles of Marketing	1	2.8%	2	5.6%	33	91.7%
Principles of Supervision	1	2.8%	6	16.7%	29	80.6%
Report Writing	8	22.2%	5	13.9%	23	63.9%
Other:	3	8.3%	3	8.3%	30	83.3%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING TECHNICIANS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	10	33.3%	4	13.3%	16	53.3%
Accounting I	4	13.3%	2	6.7%	24	80.0%
Accounting II	2	6.7%	2	6.7%	26	86.7%
Business Law	1	3.3%	1	3.3%	28	93.3%
Business Math	4	13.3%	6	20.0%	20	66.7%
Managerial Accounting	1	3.3%	8	26.7%	21	70.0%
Principles of Business	11	36.7%	9	30.0%	10	33.3%
Principles of Marketing	1	3.3%	3	10.0%	26	86.7%
Principles of Supervision	2	6.7%	2	6.7%	26	86.7%
Report Writing	11	36.7%	9	30.0%	10	33.3%
Other:	3	10.0%	2	6.7%	25	83.3%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 1 TO 99 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	0	0.0%	0	0.0%	18	100.0%
Accounting I	0	0.0%	1	5.6%	17	94.4%
Accounting II	0	0.0%	0	0.0%	18	100.0%
Business Law	1	5.6%	2	11.1%	15	83.3%
Business Math	0	0.0%	3	16.7%	15	83.3%
Managerial Accounting	0	0.0%	6	33.3%	12	66.7%
Principles of Business	5	27.8%	2	11.1%	11	61.1%
Principles of Marketing	1	5.6%	3	16.7%	14	77.8%
Principles of Supervision	7	38.9%	4	22.2%	7	38.9%
Report Writing	7	38.9%	2	11.1%	9	50.0%
Other:	1	5.6%	0	0.0%	17	94.4%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 100 TO 499 EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	6	16.7%	4	11.1%	26	72.2%
Accounting I	1	2.8%	1	2.8%	34	94.4%
Accounting II	0	0.0%	1	2.8%	35	97.2%
Business Law	2	5.6%	2	5.6%	32	88.9%
Business Math	4	11.1%	4	11.1%	28	77.8%
Managerial Accounting	3	8.3%	4	11.1%	29	80.6%
Principles of Business	14	38.9%	7	19.4%	15	41.7%
Principles of Marketing	1	2.8%	5	13.9%	30	83.3%
Principles of Supervision	11	30.6%	11	30.6%	14	38.9%
Report Writing	6	16.7%	10	27.8%	20	55.6%
Other:	2	5.6%	1	2.8%	33	91.7%

PRIORITY OF SUPPORTIVE COURSES
NECESSARY FOR PREPARING SUPERVISORS
IN THE INFORMATION SYSTEMS PROGRAM CLUSTER
FOR COMPANIES WITH 500 OR MORE EMPLOYEES

SUPPORTIVE COURSES	Priority of Supportive Courses				Nonrespondents	
	High		Low			
	Number	%	Number	%	Number	%
Accounting Basics	4	13.3%	6	20.0%	20	66.7%
Accounting I	3	10.0%	2	6.7%	25	83.3%
Accounting II	2	6.7%	1	3.3%	27	90.0%
Business Law	0	0.0%	1	3.3%	29	96.7%
Business Math	0	0.0%	3	10.0%	27	90.0%
Managerial Accounting	3	10.0%	6	20.0%	21	70.0%
Principles of Business	10	33.3%	7	23.3%	13	43.3%
Principles of Marketing	1	3.3%	2	6.7%	27	90.0%
Principles of Supervision	13	43.3%	7	23.3%	10	33.3%
Report Writing	6	20.0%	5	16.7%	19	63.3%
Other:	2	6.7%	2	6.7%	26	86.7%